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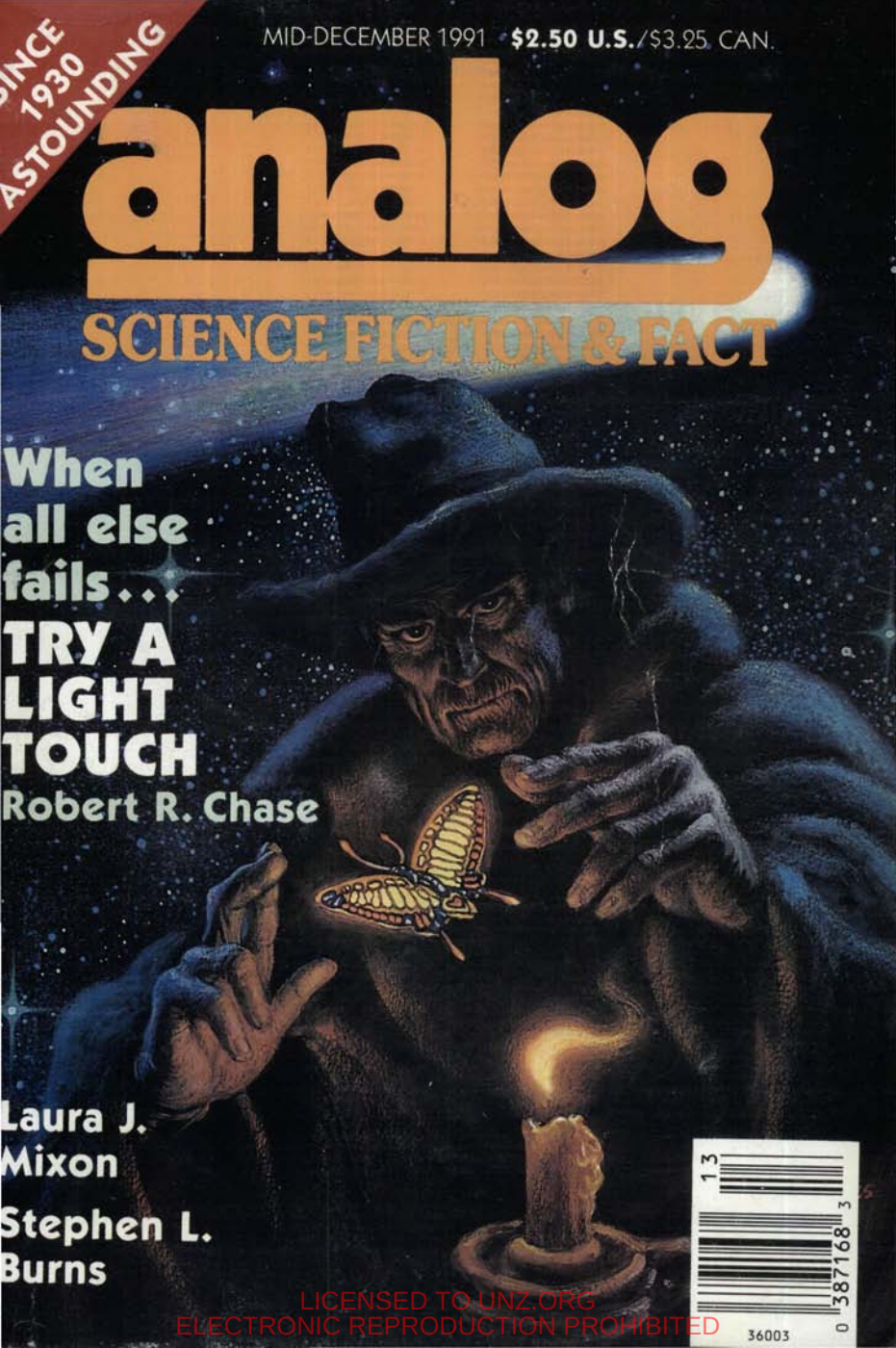

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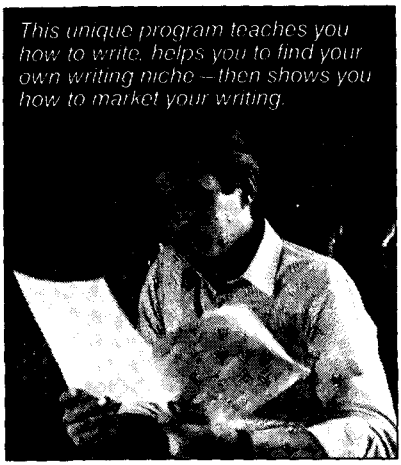
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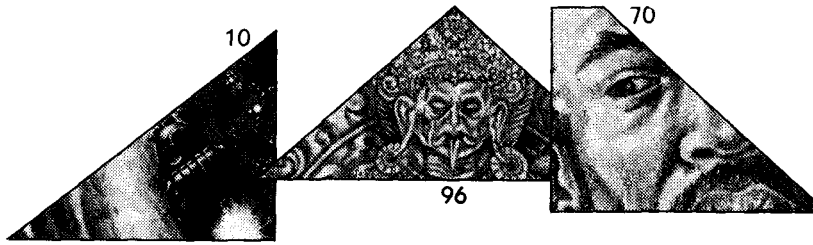

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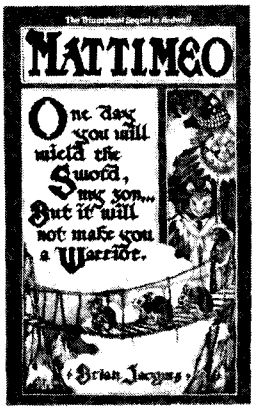
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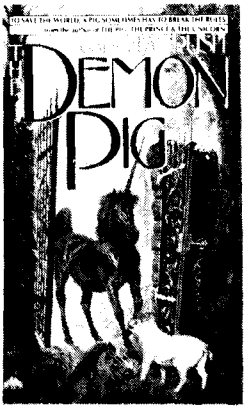

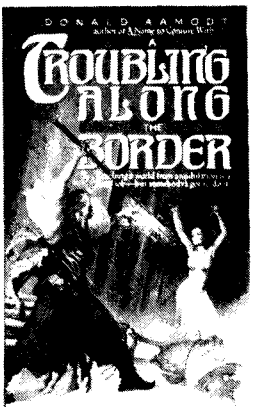

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Editorial

THE PERILS OF VICTORY

Stanley Schmidt

Now that we have a little distance from the Persian Gulf War of early 1991, it might be a good idea to try to put it into perspective. What, after all, does it say about this nation and the character of civilization?

Within a few days after the war started—and it became apparent that the U.S.-led coalition was winning it far more easily than it had anticipated—popular support for the war, and nationalistic pride, quickly swelled to levels that had not been seen in many years. Opinion polls, backed up by ubiquitous yellow ribbons, indicated enormously high percentages of the population avidly backing the war effort. Columnists pontificated here, there, and everywhere about the end of the "Vietnam syndrome" and the long-overdue resurgence of national pride.

On the face of it, that sounds like a very good thing. Nations, like individuals, need self-respect and self-esteem to do their best. Many people felt an understandable exhilaration at seeing Americans *doing* something other than the hemming and hawing that had characterized so much recent policy, and at the even more astonishing spectacle of many nations taking concerted action. And a very good case can be made that *something* needed to be done about Saddam Hussein.

But there comes a time when pride needs to be examined, to see how much of it was truly justified, and what might have been done better. However much this war might have brought out some of the best qualities of many of its participants, it also brought out others less admirable—and perhaps even dangerous.

One might wonder, for example, whether such an "easy" victory and the

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rush it brought on might tempt too many of us henceforth to regard Force as a good first approach to solving problems. Admittedly that rush was tempered somewhat by such later embarrassments as the Kurdish refugee problem, but the fact remains that what many people saw was a spectacular fireworks display in which "they" were routed and "we" (except for a few unlucky individuals) hardly felt a thing. That's very comforting for our side—but is there a danger that, having got away with it once, we might be tempted next time to make even less effort to find a better way before reaching for the bludgeon? Isaac Asimov once wrote that, "Violence is the last refuge of the incompetent." Let us hope it does not become the first.

It's also a rather sad commentary on the state of our civilization, if it's true, that after years of moping about for something to feel proud of, a good round of "kicking butt" is what it took. With all the opportunities surrounding us, to do things like building a decent system of education or health care or a flourishing program of scientific research and space exploration or a sensible energy policy, is "kicking butt" really the highest accomplishment most of us can understand or appreciate? I'm afraid so. I'm writing this during a flurry of victory celebration parades—and at a time when the U.S. space station program is fighting almost unnoticed for its life.

There also seems to be a good deal of fuzzy thinking about whose butt was kicked and who was doing the kicking. You may recall that *at the time the war started*, a large part of the public was still quite leery of the idea. Many people openly feared that the war would get out of hand, and doubted that enough had been done to find a way to avoid it. That changed, when the reports from the front began showing very high Iraqi casualties and very few Allied, to a kind of giddy pride in what "we" were doing to "them."

But wait. . . . The butt we were told we were going after was Saddam Hussein's. Yet after the war, though he and his armies were out of Kuwait (at least for the moment), *he* was still alive and in power—but some hundred thousand others were dead. How pure a pride can we feel in an accomplishment that rests on 100,000 corpses, even if they are foreign? Especially when the one individual who was supposedly the target of it all came through relatively unscathed?

And to the extent that what was done *was* a proud accomplishment, to what extent does that pride belong to those who merely cheered from the sidelines, as distinct from those who actually laid their lives on the front line?

The distinction between participants and interested spectators seems to me quite an important one, but one which is seldom made. That's not surprising, of course; we are specifically taught from a very early age to avoid making it. In junior high and high school, I was always mystified by "pep rallies," which I thought might be better described as "adrenaline fests." While I might enjoy watching a football game,

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I could never see that it mattered a great deal, except perhaps to the players themselves, who won. It was, after all, just a game. So why were the schools themselves organizing weird ceremonies in which the entire student body was encouraged—nay, expected—to jump up and down and scream shrill slogans advocating physical violence against the students of other schools?

Now I think I understand. It may seldom occur to the individual organizers, but pep rallies are practice runs. They train young citizens to suppress thought and whip up emotion against faceless "enemies," so they will be ready when called on to do so in times of war.

If that's not insidious enough, there's a more immediately ugly side to the "pep rally mentality" that becomes especially ugly when the "game" is a real war. It was very evident in the Persian Gulf War, which many watchers back home clearly viewed in much the same way as a Bowl game. I refer to my earlier comment that people were not only encouraged, but *expected* to participate in the emotional ritual. I heard numerous reports of people who were harassed by neighbors because they did *not* dis-

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play yellow ribbons on their houses or cars. At least one basketball player reportedly received threats on his life because he chose not to wear an American flag emblem on his uniform.

I respectfully submit that this sort of intolerance is by no stretch of the imagination a legitimate subject for pride.

The pep rally mentality—the tendency to identify with a group of which one is not really a part, and to demand that others do so too—is just one of many kinds of failure to make distinctions that cropped up during the war. Another type I saw or heard about many times was a galloping and irrational xenophobia—a hysterical identification of every citizen with his country, and in extreme cases of any foreigner with all foreigners. "I'm not boarding that plane if there's anybody on it without blonde hair and blue eyes," said one American traveler (on a domestic trip). "Bomb Iraq flat!" was a suggestion often heard—and never mind that that would involve murdering millions of people who did not necessarily have anything to do with the policies or actions being opposed.

Such failures of logic were not, of course, restricted to one side. After an Allied bombing of what Iraq claimed was a civilian bomb shelter and Allies claimed was a military command center, people in some Arab countries were attacking Westerners who happened to be present and shouting slogans like "Death to America!"—as if every American had personally dropped a bomb.

A letter in *Time* objected to a claim that Americans, despite having nukes, would never use them against Iraq, asking, "Which was the first and only nation to use the atom bomb?" The writer failed to consider the fact that that was almost 50 years ago and today's nation is not the same one—it may even have undergone a change or two as a result of that incident.

None of these kinds of sloppy thought—lumping all foreigners together, equating individuals with their governments, ignoring the difference between civilians and soldiers in war—is compatible with a viable worldwide civilization. And we are going to need one, quite soon. That means we face a really huge challenge: to teach people everywhere to *think* at least as much as they *feel* about crises and conflicts.

I'm glad, to a certain extent, that many Americans are feeling better about themselves. I do not deny that there were legitimate occasions for pride in the incidents of early '91. But I would like to believe that this burst of (largely vicarious) pride in "kicking butt" will be only a stepping stone to actions and attitudes deserving a more durable and less tainted kind of pride. ■

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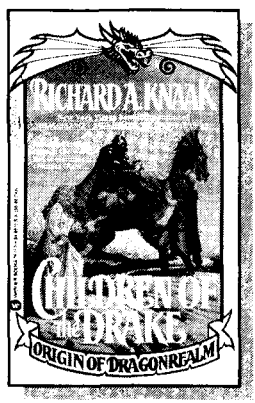

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It would appear that even dragons can be broken down into hawks and doves.

Not wishing to drag-on unnecessarily, let me just finish by saying that for anytime of the year dragons are the perfect holiday beastie.

...and when you see me around, be sure to ask me about half-pint heroes, and I will regale you with tales to the wee hours of the morning.

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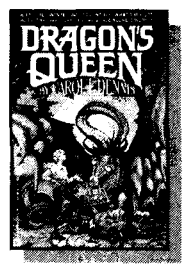

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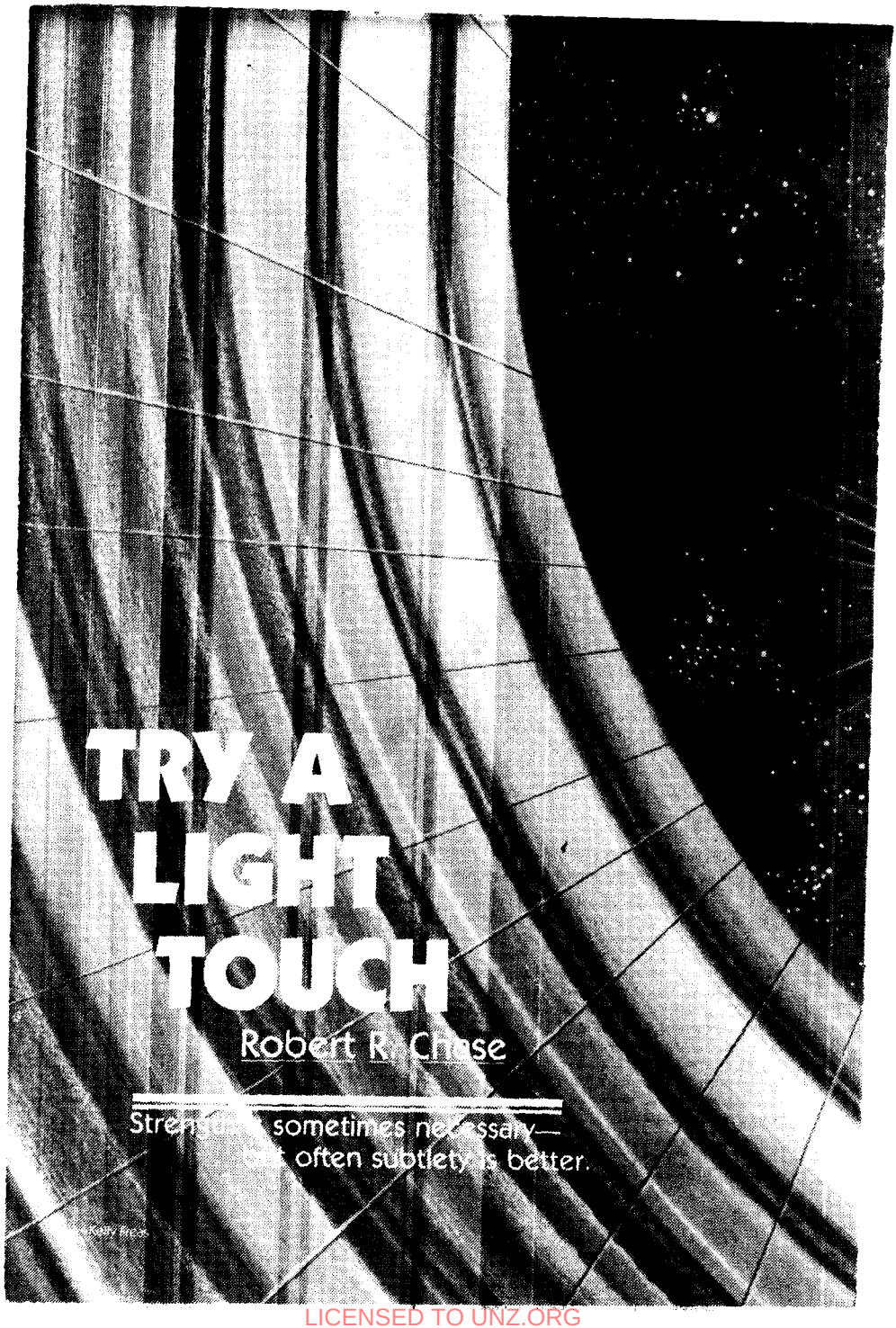

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A dark, pock-marked pear floating in a cobalt sky. Its sunward side erupted fountains of soundless light. It grew as I watched, tumbling toward me.

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I turned down the earphones. Despite the self-proclaimed miracles of modern electronics, the signal to noise ratio since we had dropped through the ionopause had become intolerable.

Besides, I already knew what the Tai Pan was trying to tell me. I was homing in on a moving target. Letokhov-Jaimeson was jerking around as if the laws of Kepler and Newton were no more than an irritating bridle, to be thrown off as quickly as possible.

One problem at a time. First, to match the lateral motion of the plummeting *Steel Goose* with the thirty-nine hour rotation rate of Letokhov-Jaimeson. I activated the impact sequence. The engines coughed, nudging the *Goose* to the side . . .

. . . and I was like Father Eagle in the legends my grandmother use to tell me, hovering high in a cloudless sky above the Carolina mountains of my home. It was cold and silent. The breeze came in intermittent breaths. I adjusted the angles of pinions and tailfeathers just enough to keep me absolutely motionless. . . .

"Jacko!" Angus shouted. "The captain says we're not dropping fast enough."

I nodded to show I understood. The descent program was close to catatonia with the conflicting inputs it was getting from the instrumentation—32,050, 32,007, 32,962, 32,975, 32,925, 32,933 . . . . The radar altimeter should definitely not be hiccuping this way. An image of the surface directly below wavered, was replaced with different terrain, and fuzzed back into something very close to the first image.

"Dust and ice shards," I explained. "Radar is having a hell of a time distinguishing ground from snow gusts. It's confusing the computer so much, it's even kicking us off our lateral fix. I'm shutting off the descent program and continuing in on manual."

Back when I was very little, a similar decision by Luke Skywalker made me cheer myself hoarse. Now I just felt sick to my stomach. It was just as well that I couldn't hear the Tai Pan's comments. She couldn't be saying anything I hadn't already thought to myself.

"Our descent is slowing too quickly." Angus looked disturbed, either at the content of his message or the fact that he was being forced to relay it. I nodded again and pressed a key. Acceleration pressed me back into the contours of the pilot's chair.

Without my noticing the transition, Letokhov-Jaimeson had ceased being "out there" and was now "below." And closing quickly.

Did you ever notice that Flash Gordon never once landed a spacecraft? I did the summer I got my first real job, working in the Cherokee McDonald's. With part of my first paycheck, I bought an exorbitantly expensive reprinting of some of the first Alex Raymond strips. I turned the pages in my bed, lost in a world of hawkmen, monsters, and the machinations of Ming the Merciless. Yet even then it bothered me that,

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whether because Raymond thought it was more dramatic, or because Flash's inbred Aryan genes had destroyed his depth perception, he never brought his spaceship down in a normal landing! It *always* crashed.

Even at that age, I had found this more than slightly implausible. Yet here I was, fifteen degrees above the ecliptic, trying to crash my craft and being nagged because it appeared I might not hit hard enough!

The *Goose* swung across the terminator. Sunlight dazzled off snow squalls racing across a hummocky, oddly cratered terrain, black as midnight velvet. The altimeter switched from three to two digits too quickly for my eyes to focus on any figure before it had changed three times. But impact should be just about—

A hill directly beneath us exploded like a miniature Krakatoa. The *Goose* shuddered and dived into the depths of the comet.

Think of going down a water slide at an amusement park. Faster and faster you go, sliding around the curves until, suddenly, you are at the bottom, careening into water that feels as thick as molasses. Intense deceleration slaps the air out of your lungs.

That gives you some idea of what it felt like to crash into the comet, except that this seemed to go on without end. At some point I must have flicked the automatic program back on (since there was no way the computer could be confused about our position now) because the *Goose* suddenly shook as its engines roared to life in an effort to embed us yet more deeply in the ice. Needles surged to the right, swung into the red . . . and, abruptly, the engines cut off.

I gasped for a few moments, waiting for my hearing to return. All the telltales shone with a steady, cheerful green. My hand trembling, I turned my headset back on. An antenna should have blown free of the *Goose* just before impact. With luck, a hydrogen balloon would be lifting it ten meters above the surface.

"*Bringer*, this is John Birdbear McIntyre. The *Steel Goose* has landed."

I let myself relax. My body floated against the chair harness, microgravity more than overcome by my shaking. This, I reminded myself, had been the easy part.

THEN

Things went wrong almost from the start. That's four billion years ago, just a few hundred thousand years after the Earth formed. An object roughly the size of Mars slammed into Earth, vaporizing itself and kicking a cloud of debris into orbit. As things cooled down the Moon coalesced from the debris. On Earth, it began to rain.

Twenty years ago, humans began establishing a permanent presence on the Moon: a Russian settlement in the Mare Vaporum, an American base inside Copernicus, and the European and Japanese Combine stations in Langrenus and Mare Nectaris respectively. On Farside, there were two observatories, on Mare Muscoviense and in Jules Verne.

Energy was cheap. The main bases depended on small, thermonuclear generators. The Farside observatories subsisted comfortably on football fields' worth of solar cells, backed up by stor-

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age batteries for the long lunar night.

With energy you can mine, fabricate, construct, grow crops. You have almost everything you need to be indefinitely self-sustaining.

Almost.

What the Moon did not have was volatiles. Oxygen for breathing could be liberated from the rocks. Carbon and nitrogen were available, but in short supply. Worse was the lack of hydrogen, which had been boiled away in the satellite's formation. Without hydrogen, there could be no water. And without water, lots of water, talk of self-sustaining lunar colonies was an exercise in self-delusion.

NOW: 3 August 76 0720

"McIntrye. I am relieved to hear you. Contact was lost for a few crucial minutes." As always, Captain Wong Toy Wun's voice was strong, precise, and more than a little intimidating. Her name meant "Colorful Cloud." There was nothing ethereal about her, though. She was about five feet two inches tall, chunky in build in a way that owed nothing to fat. Her brown eyes were serious, her manner direct.

"I was picking up a lot of static from the ionopause," I replied. "It was interfering with my concentration. Sounds like the communication programs have figured out how to filter it out."

"Had you been receiving instructions," Wong said, "you would have realized that the angle of your insertion mode has left you improperly aligned to produce anti-spinward acceleration. If you are not too tightly wedged, reorient the Acceleration Unit according to the following coordinates."

That had a concealed bite. If we couldn't move, it was my fault for turning off my earphones. If we could move, then arguably I had made the insertion with insufficient force.

Angus was enjoying this immensely. *Bad boy*, he mouthed silently. *You bad, bad boy.*

I sighed. "We are copying your transmission. We will begin angle correction as soon as Mr. MacLeod pronounces the Acceleration Unit fit to do so."

THEN: 15 Sep 75 1800

I first met Angus MacLeod at what was billed, by the sponsoring Committee of Lunar Habitations, as a mixer for all those interested in discussing possible solutions to the Restrictions. I was there because I was an unemployed freighter pilot. Three months before, the *City of Chicago* had blown up five meters above the launch pad. It had been carrying a full load of liquid hydrogen. The detonation destroyed the launching tower along with the freighter, as well as damaging three nearby launch pads and nearly destroying the blockhouse. That afternoon, NASA announced an indefinite hold on any further shipments of hydrogen to the lunar bases. Within weeks, the other spacefaring powers followed suit.

Some personnel had already been withdrawn, pending "reassessment of lunar priorities." I was supposed to be one of them. I stayed behind, instead, figuring that space freighter pilots would have little to do planetside. As far as I was concerned, piloting a hypersonic passenger plane and the unem-

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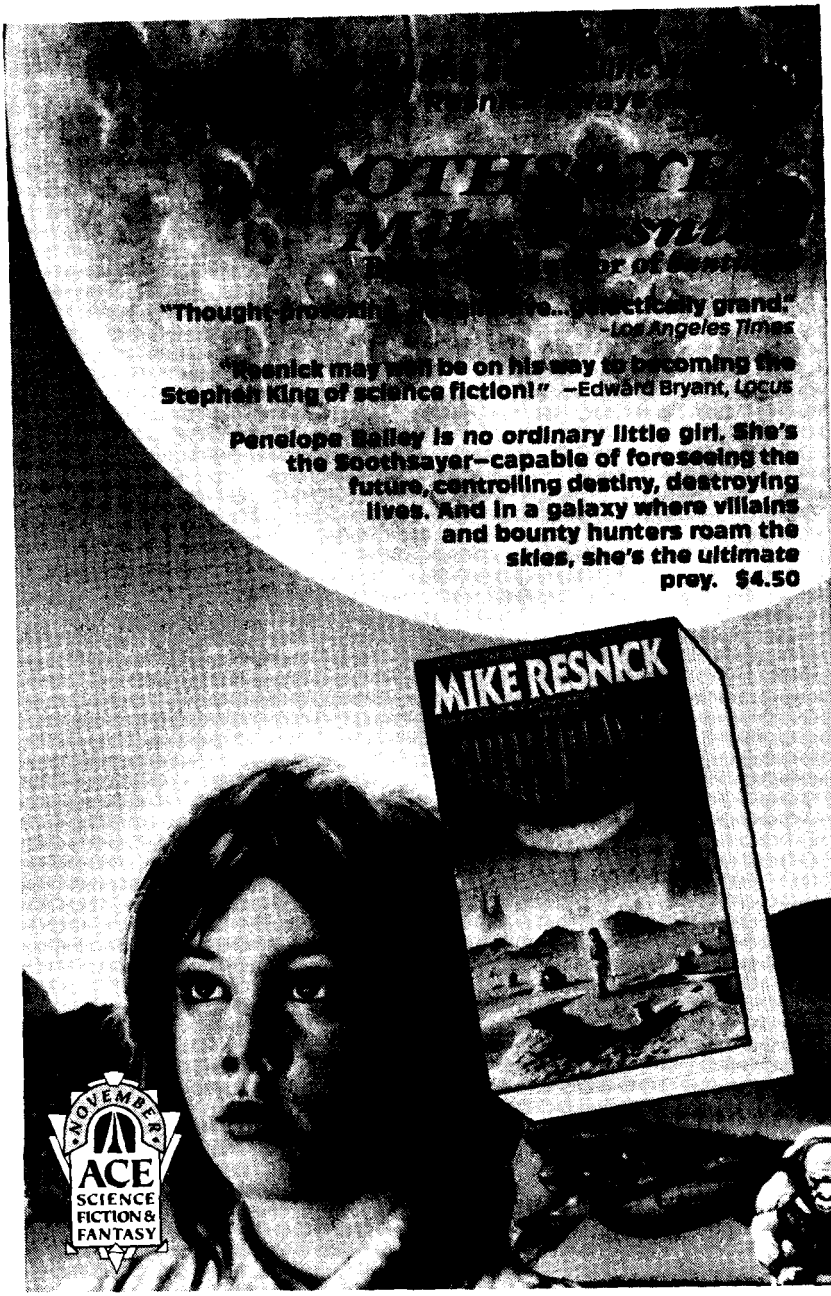
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ployment lines were both too much like the reservation.

I had picked up intermittent work flying supplies to water miners at the poles. Every settlement has its own mass driver, not just to hurl payload into orbit, but also for transportation between settlements. Water miners, though, moved around too much to cart their own mass drivers with them. They needed to be resupplied by pilots who could take off as well as land on internal reaction mass, and take off with a full load of ice or whatever else they had found profitable to dig up.

So here I was in the main cafeteria at Copernicus base with about a hundred other people who might have some skills useful in keeping the lunar bases open if downside support ceased.

"You see," Angus said, "God is always fair." He had a deep, gravelly voice, and a clipped way with his words which I only later realized was the remains of a Scots accent.

I looked at him sceptically. "Angus," I said, "do they read the Book of Job in your church?"

Angus waved this away. "Shut up, lad," he said grandly, "and kindly refrain from disrupting the chain of thought of your elders.

"As I was saying, God is always fair. Even before the *City of Chicago* turned itself to vapor, God had already put His solution to our problems in the sky. In a photographic plate, to be exact. Letokhov-Jaimeson. How many billion tons of water do we want? Fifty? Eighty? Maybe even one hundred?

"Of course, no one is saying it's easy to redirect a heavenly body. God doesna' want wimps for sons! It will take all our strength and wit to push that comet into lunar orbit. But it can be done."

"Vith an engine vhich in a computer program only exists," a newcomer put in thickly, "vhich probably cannot built be, and vhich almost certainly cannot succeed in the orbit of anything changing."

Even without the name pinned above his left shirt pocket, or the accent which made it sound like he was gargling gutturals, Gunter Moeller's overly deliberate way of talking would have marked him as Teutonic, and more likely German than Austrian.

"You have a better solution?" Angus asked, with surprising mildness.

Moeller flushed. He, like Angus, had been more than just sampling the punchbowl, which had been liberally spiked with locally produced vodka from the hydroponics wing. Unlike Angus, he did not seem to hold it well.

"Yes, Herr Doktor MacLeod, I haf a much better solution. One vhich relies on proven technology, not pipe dreams. Three tons a second! That is how much water the comet vill lose while traversing the inner Solar System. Unmanned scooper fvehicles can be maneufvered into the tail of the comet. Magnetic funnels can gather the fvapor into storage tanks. The scoopers can then this water to the Moon return.

"The scoopers can cheaply be made. The technology is proven. Do you challenge that? Do you say that there are more risks than with your Promethean scheme?"

My respect for Moeller went up a notch. Anyone who can throw around classical allusions in a foreign tongue,

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while half drunk, deserves attention.

"So you'll send your scoops like dogs sniffing up the arse of the comet for water?" Angus asked pityingly. "No," he said, holding up a defensive hand to forestall an explosion. "I grant that your scoopers will do everything you say. And that is why they would lead only to failure.

"You work it out yourself. You don't even need your pockomp. Paper and stylus will do nicely. First, write down the number of scoopers you think we can manufacture. Be generous. Underneath that, write the carrying capacity for each one. Multiply the two figures together.

"Now, how often will each scooper be able to make the trip while the comet is in range? Twice? Maybe even three times?" Every one of us knew that two trips was stretching the limits of possibility. "Choose the figure you like and multiply by that. Then, next to your result, write down the minimum amount of water needed to sustain the lunar colonies for the next five years."

Moeller had stopped writing after the first calculation. "It vill buy us time," he said heavily.

Angus shook his head sadly. "Not enough."

"But this is all so stupid!" Jenny Aldape protested. Like Moeller, she came from the ESA base in Langrenus. She was one of their mid-level administrators and one of the sweetest, most idealistic people I had met on either Earth or the Moon. "The explosion of the *City of Chicago* was tragic, yes, but that is no reason to shut down all our research stations. Surely they must realize as much as we do that that will be the result if they don't allow the resumption of hydrogen shipments."

"Some of them do," I agreed. "For some that's the whole point."

Moeller grunted agreement. Judy shook her head vigorously.

"Oh, they're not all flat-Earthers and nature boys," Angus said, using the familiar terms of contempt for radical anti-technologists, "though those get all the vid time. Some are sincerely concerned for our safety. Others see a constant drain on their budgets and wonder what the return is."

"The scientific advances from any one of our bases more than pays for the expenses of all the nations," Judy said hotly. "Just the nuclear and biological research we do that is too dangerous to do on Earth—"

"Is reason enough to shut us down for those who do not vant such research done at all," Moeller said.

"And how can ecologists and conservationists be against us?" Aldape asked. "We have built functioning closed environments, we have developed the most efficient recycling techniques because they were necessary for our survival."

"It's not that anyone is that strongly against us, lass," Angus said. "Most think they are really acting in everyone's best interest, our own included. Remember how long the American space effort was stalled after the *Challenger* explosion? And at the time the world economy was relatively prosperous. You had no international alliances whose sole purpose was to prevent ecological collapse. Aside from a few fanatics, all the downsiders wish us well. It's just that they think there are more

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pressing demands on their treasure and attention."

"All rationalizations for failure of nerve," Moeller said.

Angus shrugged. "Perhaps. But all the more reason for us to look to ourselves for salvation."

"Then there's a problem with your acceleration unit which you had better address," I said. No one called it the *Steel Goose* until it had been constructed, and even then it was never the official name, as officialdom considered it too undignified.

"I downloaded the plans from the *Daily Lunatic* four days ago. Angus, I don't know about thermo-fusion plasma jets, and I certainly don't know whether that shell you've designed will withstand the stresses you plan to put on it. But I have a very good feel for how much reaction mass it takes to get from one place to another in space."

Moeller gave me an odd look. I realized he knew no more of me than I did of him. "I'm a pilot," I explained. "Used to do the hydrogen run on a regular basis, in the *City of Chicago*, among others."

I turned back to MacLeod. "Your reaction mass tanks are *pitiful*. I know that once you get out there you intend to use the comet itself as fuel. But your tanks have hardly any capacity for attitude adjustment! How in hell do you propose to get out to a comet which won't even be in the ecliptic?"

"I propose to hitch a ride," Angus said mildly, "from that lady who just came through the doorway."

I turned and looked. At first, I had no idea to whom he could be referring. "You mean the one who looks like a cross between a master sergeant and a nursing supervisor?"

Angus nodded. "Wong Toy Wun."

It took me a second to place the name. "Not . . ."

"The same." Angus grinned.

Wong Toy Wun was second in command of the Japanese Combine's solar sailing fleet. Their robot probes had completed the mapping of Mercury. They were now swinging ever closer to the Sun, sending back a constant stream of data on the chromosphere and photosphere.

Yet it was not these solid achievements which had brought Wong notoriety. Rather, it was a bet which she had won by bringing a light sail down from lunar orbit to skim across Mare Vaporum. The sail had been three kilometers on a side. The lowest point of its now highly eccentric orbit was a Russian radio tower. Strapped to the top of the tower had been a steel bar surmounted by a steel ball. The whole thing had been perhaps three feet long.

I had seen the pictures. One instant, there was just the top of the tower. Then the light sail swooped into the field of vision like a razor blade slicing through the night. Below the sail, at apparent eye level, the control pod rushed at the viewer. Leaning out from the pod, at just the angle of a merry-go-round rider reaching for a brass ring, was a human figure. Almost too quickly for the eye to follow, the figure grabbed the bar and swept beyond the field of view.

That stunt, done on a bet, cost Wong a month's salary. It also made her a hero. No matter that it had been an unauthorized departure from orbit, one which had endangered life and prop-

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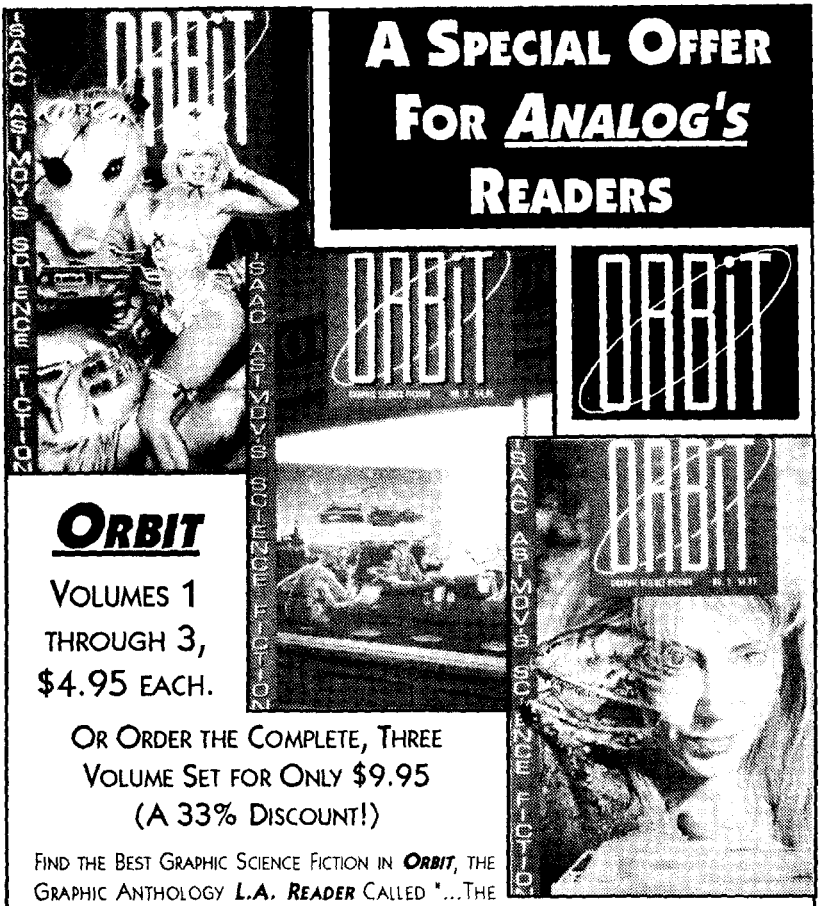

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erty. It had proved once and for all that light sails were far more versatile, far more *precise* craft, than had previously been acknowledged.

I stared at her, surreptitiously I hoped, trying to reconcile the daredevil reputation with this stolid, pragmatic-looking woman who seldom smiled.

Much later, when it was too late to do anything about it, I heard that the committee had already made its choice, that the only purposes of the mixer were to hear any last minute alternatives—and to choose a crew.

NOW: 3 August 76 0900

Angus took command of the *Goose*. I was demoted from pilot to gopher. The first thing we had to do was determine the exact angle of the *Goose* relative to the comet's axis of rotation. This took three days. Each time we tried to confirm a set of readings, we would find that they had shifted slightly. Finally, Mary Rostova, our navigator as well as our expert on comets, who had stayed with Wong in the *Bringer of Celestial Nourishment*, realized that the problem was not with our instruments but with the comet. Lying still in the *Goose*, we could hear ice scraping and hissing past the sides of our hull. Distant *booms*, sounding like summer thunder, shook the *Goose*. The surface of the comet was churning as it heated up from its interstellar deep freeze. Even down a kilometer, we were being moved about by the shifting crust.

If we had thought it through, we would have started some serious worrying at that point. As it was, we were too relieved to discover that our instruments were operating correctly to consider the implications.

Angus handled the *Goose* with a sensitive, delicate touch. Having decided with Wong and Rostova how its orientation had to be changed, he heated one segment of hull. Ices liquefied, then vaporized. Vents pulled in the steam, pumped it around to the opposite side of the *Goose* and expelled it as reaction mass, pushing the craft into the space it had just melted for itself.

After ten hours, we had the proper alignment. While we slept, the ice hardened around us again. One hundred and fifty cubic miles of ice, which has been chilled for eons at four kelvins, constitutes a formidable heat sink.

The next "day" Angus initiated the sequence which split the long, tapered nose of the *Goose* lengthwise into three sections. Each slowly melted its way through the ice until all were ninety degrees away from each other. Again we slept, giving the ice time to clench us fast once more.

On the sixth day since we had embedded ourselves in the comet, after receiving permission from Rostova, Angus looked at me and grinned.

"Shall we see how we do as minor godlings?" Without waiting for an answer, he pressed the key which triggered the ignition program. Inside the reactor, a small bit of the Sun flared to life. Water touched it and flashed into plasma. It exploded out the one pathway open to it, jetting away from the *Goose* at a substantial fraction of the speed of light. The hull groaned and it pressed against the ice.

Far above us, Letokhov-Jaimeson grew a new tail.

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* * *

THEN: 24 September 75 1030

"Why do you want to be a member of this venture?" Wong had asked.

I was uncomfortable, even though she had asked me to sit. Berths on the *Bringer of Celestial Nourishment* would be few. Wong had been chosen as captain. Angus had been selected at the same time, since the plan was to have her transport Angus's acceleration unit. That left only two more spaces.

My own chances were slim. I had always had the suspicion that beneath their reserve and formality, most Japanese were unregenerate racists. Caucasians, if properly washed, deodorized and disciplined from infancy, might eventually attain the status of human beings. A black Amerindian, on the other hand, could not hope to rate more than marginally above a gorilla.

"I have the most varied and extensive background in piloting reaction vehicles of anyone on your list," I said, hoping it were true. "All sorts of vehicles, from hydrogen freighters to jet chairs. Likewise, everything from completely computerized boosts to literal seat of the pants flying. Piloting the *Goose*—"

Wong frowned. "You mean to say the Acceleration Unit. We do not wish to draw ridicule on a venture which already has strong opposition."

I flushed. "No, ma'am." There was no point in mentioning that, given its form and function, *Steel Goose* was by far the most socially acceptable nickname for the craft.

"However, as I was saying, piloting the Acceleration Unit into the comet, and then flying the entire comet back to lunar orbit, are tasks for which no specific training is applicable. What is needed is flexibility and the ability to learn quickly. These are the qualities I will bring to your crew if I am chosen pilot."

This last bit sounded stiff even to me, as if it had been memorized in advance. As indeed it had been. I saw the corners of Wong's lips twitch and braced myself, fearing the worst.

"I believe my use of your language was precise," she said. "I did not ask you what you could contribute to our crew. I asked you why you wanted to be a member."

For a moment, I hesitated. It was only her reputation for being devastating with cant that decided me. If I were to be thrown out, it might as well be for the truth.

"I grew up in Cherokee, North Carolina, just outside the Qualla Boundary Reservation," I said. "I didn't have much to do with it, or the nearby Oconaluftee Indian village. My mixed heritage was only part of the reason. When I was quite young, my father read a black social scientist named Sowell. Sowell's contention was that the success of ethnic groups in the United States varied inversely with their dependence on the federal government. At the top of the totem pole were peoples like the Chinese and the Jews. They had a strong ethnic sense of who they were and formed their own enclaves where they strove for their own successes as if there were no government. At the bottom were peoples who, through conquest, kidnapping, and resettlement, had become totally dependent on government largesse: blacks, and even worse, Indians.

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"Don't misunderstand me. I *liked* Qualla. Compared to reservations I saw later in the American Southwest, situated on land so godforsaken even the scorpions had left because nothing lived there for them to kill, the reservation was lush and vibrant. Oconaluftee kept the old ways alive as well as it could, and even gave interested whites a glimpse of what the Cherokee had once been.

"But even the best museum is no substitute for a living community. If Sequoyah lived today, he would want something more than to be director of Smithsonian South. He would want his people to be independent, to be able to choose their own destiny.

"People on Earth were losing their nerve even before the *City of Chicago*. Species die-offs, depletion of the ozone layer, acid rain, the ice caps melting . . . I'm not saying these aren't real problems. But the way governments have been reacting has been to fence everything in. Their idea of security is a warm straitjacket of regulations. What they are succeeding in is turning the entire planet into one large reservation. Only we won't even get the pleasure of making visiting white-eyes feel guilty.

"I got away from that when I was eighteen. I've been making my own way ever since. I don't ever want to be put back on a reservation. Not even if it's as large as all the Earth."

I took a deep breath. It was more than I had meant to say. Looking at Wong's impassive face, I winced. Nobody wants to be confined for eighteen months in close quarters with a political fanatic.

"That will be enough," she said. "You will be informed of my decision within a week."

I stood glumly and made a short, awkward bow. I turned to go.

"One last thing," Wong said. "You may have been told that my Japanese employers are a proud, ethnocentric people, that they look down on others as racially inferior."

"I have heard such talk," I said carefully.

"It is much exaggerated," she said. "Most Japanese are both intelligent and sensitive, valuing their culture while feeling no need to denigrate others.

"Nevertheless, there is just enough truth in that slander to make me grateful that I come from Taipei."

THEN: 15 December 75 0500

Even three months later, I found it hard to believe that I had been chosen. My chest constricted as the mass driver hurled us forward with seven gees —seven Earth gees—acceleration. Then an abrupt release. My eyes bulged. Blood surged into cheeks, lips, and finger tips. The surface of the Moon curved silently away below us.

We did our first systems check of the *Bringer* to a background of radio chatter. Various orbital stations had seen our launch and were querying us about our destination. Wong ignored them. A bit later, direct transmissions came through from Belgium and Washington. We were sternly warned to attempt nothing which might interfere with the natural orbit of Letokhov-Jaimeson.

A Texas drawl responded from Copernicus, reassuring all that the probe just launched had been for scientific purposes only. And besides, how could

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a little ol' spacecraft like the *Bringer* push around a great big comet?

A week later, I took control. For all of ninety minutes. At my command, the *Bringer* tilted fifteen degrees to the ecliptic. The rockets fired for thirty minutes. When the reserves of hydrogen and oxygen were gone, explosive bolts hurled away the reaction unit and its fuel tanks.

That quickly my time of command was over. "Deploy sails," Wong ordered. Nearly simultaneous blows seemed to ring through the hull as the lock pins released. Micron thick heliogyro sails spun themselves out by centrifugal force. It took two watches for the twelve sails to stretch themselves to their full forty kilometer lengths. Wong angled the sails. They sliced through darkness, became blinding blades of sunlight. We fell inwards.

NOW: 15 August 76 0630

"So have we succeeded in stopping the rotation or not?" I asked.

"Hard to say," Angus replied, distracted. His hands were making tentative motions in the air which I had come to recognize as the only remains of the smoking habit he had had to leave on Earth. Fingers still grasped for a bowl to clean and pack anew.

"We've killed all the spin we had originally," he continued, "The problem is that the surface explosions keep imparting new spin. At least, we are now at the poles of rotation, so it shouldn't affect us if we apply thrust."

"If the Tai Pan gives the order," I said.

"Captain Wong is not causing the delay," he said. "Rostova seems to be upset with some of the data we are relaying, though I can't say why. The *Goose* has performed flawlessly.

"By the way, you really shouldn't refer to the captain as Tai Pan. Not just because it irritates her, either. It is incorrect. The title refers to the head of a commercial enterprise. It doesn't really apply to a ship captain."

I was debating whether or not to tell him it was also the name of a venomous snake, when we were interrupted by the communicator.

"Mr. MacLeod." Wong's voice crackled as if formed out of static. "Dr. Rostova informs me that the rotation of the comet has been damped to acceptable parameters. You may initiate the thrust sequence."

Angus took a deep breath. "Aye, Captain." At his command, the separate parts of the nose melted their way through the ice and came together. Then he rotated the *Goose* along the line of the comet's orbit, but in the opposite direction. Once again we waited while the ice locked us in position.

"At your command, Mr. MacLeod." The ionopause had really begun to act up as the comet swung closer in to the Sun. Each word was outlined in hisses and crackles.

"Thank you, Captain." To me: "Now we'll see if I built this as well as I have said." He winked. "Be a good boy and I might even let you fly this comet once things settle down."

The engines rumbled to life. Thrust built slowly. For the first time, Angus was going raise the *Goose* to maximum power.

It happened when we had reached 75 percent thrust. A rushing grew to a rum-

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ble which vibrated the hull, dwarfing even the roar of the engine. Several sharp *cracks* sounded simultaneously. Angus and I were both reaching for the controls when the alarms rang through the cabin and the automatics cut off the engine.

"It is like trying to change the *craACKLE* of a snowball with a bullet." Rostova's voice was bitterly elegant, even through the static. It had taken her three hours to work out the equations of failure and check them with Mare Vaporum. Unfortunately, they could find nothing wrong with her figures.

"All our *hiSS*tion was taken with the question of whether we would be able to rendezvous with the comet, and then with whether the *POP*eration unit would be able to produce enough thrust to move the comet without destroying itself. It was more than strong enough. Only the comet was not strong enough to be moved.

"After . . ." Words faded away in static hiss. ". . . holds any planetary body together? Gravity, of course. But when the gravity is as slight as that generated by Letokhov-Jaimeson . . ." She let the thought hang in the air.

"That can't be right," I said, without thinking. "If the comet were that loosely aggregated, we never would have been able to stop its rotation."

There was a long pause. I began to wonder if I had offended her.

"You are correct," Rostova said at last. For a few seconds, the channel was oddly static free. "I was speaking with my emotions. Even microgravity, over the millenia, gives it some sort of internal integrity. The sonargrams I have made from the data you have beamed up suggest that there are two or three rocky bodies at the center. Even the melting the comet has undergone in its ten previous trips through the inner Solar System has stiffened the internal structure."

"How much thrust will it take?" Angus asked, cutting through to the important question.

"Perhaps two-thirds of maximum," Rostova said, after a moment. "I would begin to get uneasy at anything over 50 percent."

"What sort of orbit does that permit us?" I asked.

Another pause. "Nothing that goes directly into Earth-Luna orbit. You could nudge it in the direction of Jupiter. In about four years it would swing back this way. If we had the time, we could pick it up then. But we do not have that time. The bases received their formal evacuation orders two days ago."

"In addition," Wong's voice said, "warrants for our arrest have been issued."

"On what basis?" Angus asked angrily.

"Unauthorized ecological interference. It is a new crime," Wong said drily. "There is also something called reckless endangerment."

The latter charge made some sort of sense. After all, less than dexterous handling of the comet could result in it impacting Earth. It would be destructive even if it landed in the ocean or in a desert. If it landed in a more populated area . . .

"It's goddamned unfair," Angus

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complained. "I don't mind being arrested, but how can they arrest us for failing to do what they're charging us with?"

"What do we do now?" I asked.

"Remain on station," Wong said tersely. "The settlements are working on salvage plans. I am sure we will be notified when they have something."

15 August 76 2300

Despair is exhausting. I was asleep almost as soon as I went off watch. Closing my eyes on my sleeping cubicle, I seemed to open them in a darkened lodge. Across the table sat a man in loosely fitting grey robes, his face shadowed by a tall, wide-brimmed hat. He reminded me of Gandalf. I looked more closely. The face was clean-shaven, the skin nut brown. I recognized a medicine man I had known years before in Oconaluftee.

Dark brown eyes watched me intently. As soon as he saw he had my attention, he lit a candle. It flamed normally, at first. Then it pointed off to the side, as if being blown by a wind I could not feel.

The magician made a quick hand motion. A butterfly sprang away from his hand and fluttered over to the candle. It dived and swooped toward the flame. I worried that it would incinerate itself.

Yet as it danced through the heat currents, I became aware that somehow it was moving the flame across the table.

Brown eyes watching me steadily. *Understand. Remember.*

NOW: 16 August 76 0220

The sound of my breathing was harsh in my ears. Sweat had glued my clothing close as a second skin. I lay rigid in my sleeping cubicle, straining to keep hold of every detail of the dream. The answer was there, if I could remember and understand.

After a moment, I thought I had it. I also had a new problem. How was I going to convince Wong? Something casual, like: "Did you know that the structure of benzene rings was discovered in a dream? Well, a funny thing just happened. . . ."

I undid my floating tethers and slid open the sleeping cubicle door. I kicked myself out into the main cabin, grabbed a handhold to twist myself "upright," and shoved off in the direction of the pilot's chair.

"Uh, *Bringer*, this is McIntyre on the *Goose*. I have an idea I would like to discuss with anyone who has a minute to spare."

There was a minute of silence. I was on the verge of repeating the call when Wong's voice sounded hoarsely in my earphones.

"I trust this idea is of sufficient urgency that it requires broaching immediately."

For the first time since getting up, I focused bleary eyes on the chronometer. "My apologies, Captain, for waking you four hours into your sleep period," I said guiltily.

"You think you have a way of moving the comet without tearing it apart?" Wong asked sharply.

The tone stung. "I think I have come upon a way you can move the comet. If you are a good enough sailor."

Immediately, I wanted to bite my tongue. What I wanted might well be impossible. There was no point in an-

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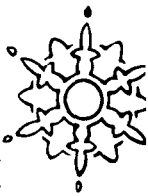

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tagonizing the one person who might be able to make it work.

"Describe your plan," Wong said shortly.

The frustrating thing was that I could not do that. Not directly. I needed to talk it through so that I could see if I thought it feasible. Hell, I needed to talk it through so that I could know what it was!

"Remember how it was when we were closing in. The comet was stuttering all around the parabola it was supposed to be following. The incremental changes were small, but measurable enough to drive the computer to near breakdown."

"The perturbations canceled out," Wong said.

"*That was just the first clue,*" *I said.* "A few hours ago, Mary was blaming herself for not realizing how little rigidity the interior of the comet would have. I don't know what she was thinking of, but my guess is she was remembering that comets have been known to split apart."

"I am on," Rostova announced. "Yes, that was one of the factors I was considering."

"OK. So our comet dives into the inner Solar System. From a frigid snowball, it becomes a volatile snowball. The ices don't just sublime into coma. They can't because of the sooty crust which covers the entire surface. Instead, the crust absorbs the heat, raising the temperature until the pressure becomes too great. Gases then erupt through the crust to form the coma and tail."

"That is basically correct," Rostova said cautiously.

"So what?" Wong asked.

"The eruptions can be great enough to split a comet or move one into a new orbit," I said. "Letokhov-Jaimeson would move away from a simple orbit except for the fact that the eruptions, as you say, cancel each other out. But what if they didn't? That sometimes happens naturally. Halley's orbit lasts four days longer each time around the Sun. Brorsen-Metcalf speeds up by about fifteen days.

"What if you controlled the rate and direction of eruptions? By shading the surface with the sail."

Silence. "I would have to come in close to do that effectively."

I could almost hear her thinking. The sails were nearly four times as long as *the long axis of the comet nucleus. On* the other hand, each sail was only twenty meters wide. Wong would be able to move the *Bringer* no closer than the ionopause. At that point, the solar wind, on which the *Bringer* sailed, gave way to the atmosphere of the comet. That was about 4,600 kilometers from the nucleus.

I thought of the last time I had flown in an aircraft, watching the shadow of the plane blur and vanish below me. Twenty meters seemed terribly thin. But the *Bringer* would be at an angle to the Sun, so that the shadow should be an oval, solid at the center, fuzzy toward the edges. I wished I could remember enough optics to work out what that crucial height would be for the sails of the *Bringer* to cast a large enough shadow.

Rostova's voice interrupted my thoughts. "Please turn up the external microphones," she asked. "We will try

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to sail as close into the ionopause as we can without endangering the *Bringer*. I want to obtain as much data as I can on how we affect the ice."

For most of a week, nothing occurred worth recounting. I imagined Wong tacking ever so carefully closer to the comet. It had appeared huge when the *Goose* had launched itself from the *Bringer:* an enormous burst of light, like a continuous nova. I had had to turn my head to find the edges where the stars shone through the brightness. Wong would not enjoy moving the sail closer.

Nor should she. If she came too close, she would lose her ability to maneuver and we would lose our ability to quit and go home.

The ice grew quieter. The rasping along the side of the hull ceased; the boomings became more distant. It occurred to me that an unlooked-for benefit of Wong's artificial eclipse might be to cool the comet sufficiently to make it rigid enough to stand increased acceleration. I mentioned this thought to Rostova.

"I am sorry to say that the internal structure of the comet does not work that way," she replied, after a moment. Through the static I heard a series of hums and clicks, which indicated that she was checking the main computer through her workstation.

"Why not?" I asked.

An impatient sigh came over the earphones. "The modeling mathematics would take too long to explain. Think of it this way: in Petersburg, all the children know that really cold, powder snow is the worst type for making snowballs. This situation is analogous."

Really? In North Carolina, all the kids knew that the way to make a really punishing iceball was to partially melt a snowball and refreeze it. I held my tongue despite that. It was Mary's area of expertise after all. I was just feeling argumentative because I had too much time on my hands.

Despite my fears, Wong had been able to shadow the nucleus without much difficulty. As Mary explained, the Moon manages to throw a large, well-defined shadow on the Earth, even though the distance between the two is roughly one hundred times the Moon's diameter. In our case, the distance was fifteen times the length from the tip of one sail to the end of the sail opposite.

As Wong shaded more and more of the nucleus, Mary refined her models of the interior, calculating the lag time between surface heating and the resultant explosions. It seemed to me that they were making progress quickly. By the sixth day, all eruptions took place in a band within thirty degrees of the direction of orbital motion.

"This will not work," Wong announced without preamble.

"You have the timing down," Angus protested. "We can tell that from down here."

"That is unfortunately not enough. A side effect of our tampering has been to substantially cool the comet. The eruptions are correspondingly less energetic. Even with the acceleration unit producing the maximum safe amount of thrust, we will not be able to alter the orbit by the necessary amount."

It was, I thought, about time to hit the firewater. Unfortunately, the only

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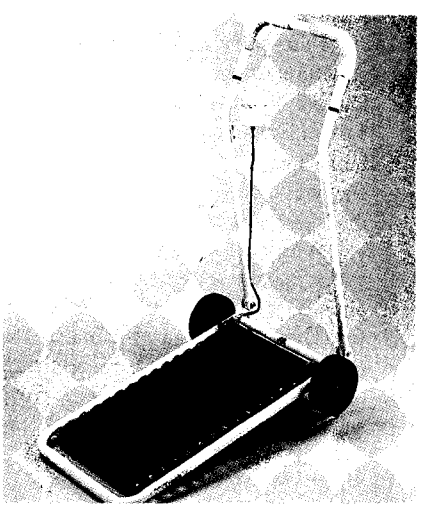

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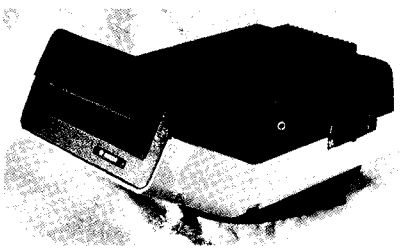

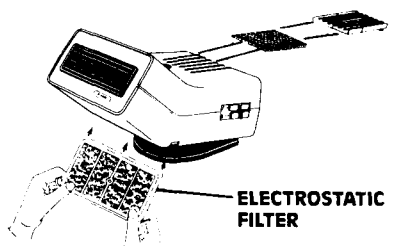

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alcohol anyone had brought along had been champagne, to celebrate our success. And that was out of reach, aboard the *Bringer*.

Six hours later, Mary's voice on the comm link interrupted these gloomy thoughts.

"Captain Wong has decided to test my thermal resonance model. Please —"

"What is—" I began.

"—secure all articles and strap yourselves in. I have no way of calculating just how severe the shock waves will be where you are."

Already, there was an intermittent, distant roaring. It reminded me of the way thunderstorms used to come across the mountains. A steady crescendo of noise, which I used to think of as Godzilla's footsteps. Any moment, it would lurch into sight and the next instant it would mash me flat.

The booming moved ever nearer. The cabin vibrated so much my eyes blurred. Godzilla seemed to be doing a war dance all around the *Goose*.

After a while, enough of my hearing returned that I could determine that the din was moving away. I fumbled at my straps. It took an inordinately long time for my fingers to get enough coordination to free me. The flesh underneath was bruised black.

Only then did it occur to me to be grateful that there was air in the cabin.

"What in hell," Angus asked hoarsely, "did you *do?*"

"I guess we should have given you two a bit more warning," Mary said contritely. "The captain just wanted to test an extension of John's idea. If we are to turn the comet into its own rocket, we need to increase its activity, not decrease it. The sail is made of the most reflective fabric which has ever been created. She thought she could make use of that. We have entered into a series of maneuvers which will allow us to keep a safe distance from the ionopause while directing reflected sunlight onto selected portions of the comet's surface.

"From what I can tell from my instrument readings, it's been successful in increasing surface activity."

"Not just surface," Angus muttered.

I was silent, trying to remember my dream in detail. Had I noticed light reflecting off the butterfly's wings?

Wong's precise dance of shadow and brilliance did more than shift the orbit of the comet. Explosions caused by sunlight flashing off the sail acted like a child's warm hand, melting, compressing, hardening this enormous snowball. Angus was able to fire the *Goose* at nearly 90 percent of full power.

L'ENVOI

There came a time, not much more than a year later, when Angus and I walked for the first time on the surface of Letokhov-Jaimeson. We made our way to the rim of the large depression the *Goose* had melted on this side of the comet while jetting away 10 percent of its mass as exhaust.

A crescent Earth rose over a horizon near enough to touch. All over the planet, people were looking at the sky with wonder as a stream of radiance divided the night in two. They looked and thought on the fact that the craft which brought this comet captive into lunar orbit was too small to be seen with their unaided eyes. They wondered at the

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combination of delicacy and brute force which had forever altered the celestial order. Perhaps they would now turn back to their work, whether it was growing crops or raising children or preserving endangered species, convinced that nothing need be impossible for them.

Stars twinkled and shifted in the turbulent haze. With an almost terrifying suddenness, a line of darkness bisected the sky. Mary's countdown sounded softly in my ears as Angus and I reached the crest of the rise. Ice beneath our feet gave way to a wrinkled reflection of the stars overhead. In the sky, the line of darkness quickly widened and plummeted into the valley we had just left. We stood on a plain transformed to silver. Lightsails swaddled the comet, cooling it against the water robbery of the Sun.

Butterfly wings close upon a flame and extinguish it. For an instant, stars become a constellation resembling a Cherokee Gandalf.

You are off the reservation. This darkness giving way to deeper darkness is what has been Reserved for you from always.

We waited for the pick-up ship, talking about prison sentences and laughing quietly at their irrelevancy. ■

●Everyone talks ceaselessly about not overdoing things, and no one does anything about it.

Jean de La Fontaine

●In war as in love, we must achieve contact to triumph.

Napoleon Bonaparte

●Like medicine, philosophy has many drugs, very few good remedies, and practically no specifics.

S.R.N. Chamfort

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Ronald V. Dorn, Jr. M.D. &
Geoffrey A. Dorn, Ph.D.

PROTECTING HUMANS FROM IONIZING RADIATION IN SPACE

Humans in space are exposed to numerous hazards which must be overcome, particularly if they are to remain in space for extended periods of time. These hazards include punctures by micrometeorites and space garbage, collisions with larger objects, the need to maintain a closed life support system, the ill effects of zero gravity on muscles, bones, and the immune system, and the potentially lethal effects of ionizing radiation. In this article we discuss possible methods of protecting people from the effects of ionizing radiation. Some of these approaches are the subject of active research, while others are more speculative.

How can the crew and passengers of a spaceship be protected from the continuous "rain" of ionizing radiation? Over time, this steady stream of radiation will have fatal effects on humans. The intense radiation associated with solar flares could be quickly lethal. There are several ways to deal with this hazard. These may be grouped into biomedical and applied physics-engineering methods. Biomedical methods include genetic engineering, recombinant DNA procedures, immunological methods, and pharmacological techniques. Applied physics and engineering methods include mass and magnetic shielding.

Ionizing Radiation in Space

Before we discuss methods of protecting people from the effects of ionizing radiation, we must understand what this radiation is, and how it affects living tissue.

The term "cosmic rays" is applied to ionizing radiation from two sources: the background or galactic radiation from sources beyond the Solar System, and the solar wind. Galactic cosmic rays may come from any direction, whereas the solar wind is highly directional.

Although cosmic rays are primarily protons (hydrogen nuclei), cosmic radiation contains nuclei of essentially all elements, neutrons, and non-particulate radiation (e.g., x-rays and gamma-rays). At the Earth's orbit, the density of hydrogen nuclei in the solar wind is about 5 particles/cm^3 traveling with a mean speed of about 400 km/s.[1] Since the particle flux falls off rapidly with increasing atomic number, the flux of iron nuclei at a given energy is more

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than four orders of magnitude (10^{-4}) less than that of hydrogen nuclei.[2] During a moderate to large solar flare, the total flux of charged particles may increase by several orders of magnitude.

The ability of ionizing radiation to cause tissue damage is directly related to the transfer of energy from the radiation to the living tissue. *Linear energy transfer* (LET) is a measure of the rate of energy loss per micron of particle track. In general, high LET radiation can cause significantly more tissue damage than low LET radiation.

The ionizing power of the atomic nuclei in cosmic rays displays a very curious behavior (Figure 1).[2] At very low particle energies (low velocities), a phenomenon called "electron capture" occurs: the charged nuclei recover electrons, and the particle charge approaches 0. As energy (velocity) increases, electron capture becomes less likely, and ionizing power rapidly increases to a peak. Curiously, as velocity continues to increase, the ionizing power decreases to a minimum. Finally, as velocities become relativistic, the ionizing power stays constant or increases slightly. The ionizing power also increases rapidly as atomic number increases. As a result, the ionizing power of an iron nucleus at a given velocity may be several times that of a hydrogen nucleus.

The ionizing power of non-particulate radiation (x-rays and gamma rays) is typically significantly less (lower LET) than the ionizing power of stripped atomic nuclei. The ionizing

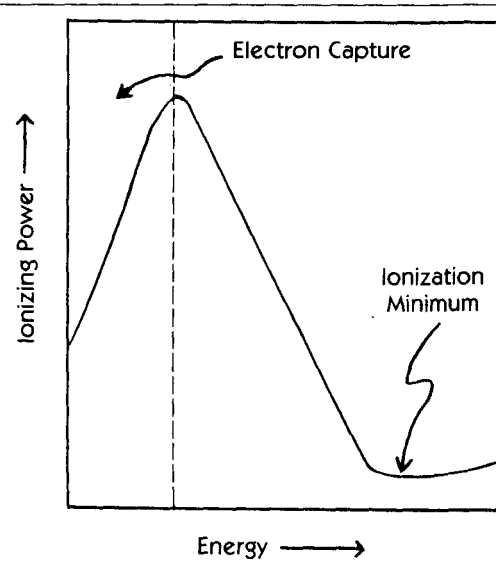

Figure 1: Ionizing power as a function of particle energy.

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power of neutrons is related to the velocity of the particle. Thermal (slower) neutrons have an LET slightly greater than that of x- and gamma-rays. Fast neutrons have an LET on the order of that for a proton with a similar velocity, which is significantly less than that due to heavier atomic nuclei.

To summarize these characteristics, cosmic rays consist of nuclei of essentially all atomic numbers. Extra-solar cosmic rays are essentially omni-directional. Particle flux increases significantly during a solar event, and decreases with increasing atomic number. Ionizing power or LET increases with increasing atomic number, and with decreasing velocity for atomic nuclei. The ionizing power of x-rays, gamma-rays, and neutrons is typically significantly less than that of atomic nuclei. These factors all play an important role in schemes designed to protect humans from ionizing radiation in space.

Tissue Damage Caused By Ionizing Radiation

Tissue damage caused by radiation occurs in two phases: immediate and delayed.[3] Most of the damage is chemical in nature, affecting the molecules of the tissue cells. Five modes of cellular damage occur.

First, many of the water molecules in living tissue undergo radiation-induced hydrolysis to yield a variety of damaging free radicals: hydroxyl ions (OH^-), free electrons (e^-), and hydrogen ions (H^+).

Second, the oxygen in living tissues breaks down into several peroxide products and free monatomic oxygen, which are very destructive to healthy tissue. The severity of the tissue damage is directly related to the amount of oxygen present at the time irradiation occurs. Strangely, the oxygen necessary for life contributes directly to the lethality of ionizing radiation. A severely hypoxic person would suffer much less tissue damage when exposed to ionizing radiation than a healthy person with an abundance of oxygen in his tissues.

Third, significant direct damage occurs to the large protein molecules comprising the structure of the cells and the structures within the cells, resulting in numerous ionized fragments and free radicals.

Fourth, the damage suffered by DNA molecules in cell nuclei is most important. If sufficient DNA damage occurs in enough cells, reproduction of the cells will be slowed, altered, or stopped. This prevents the cells from repairing or replacing themselves, and may cause the death of the entire organism. The most serious types of DNA damage are double strand breaks (DSB) and single strand breaks (SSB). DSB are the critical event in radiation-induced cell death.

Fifth, if there is sufficient cell membrane damage with disruption of a sufficient number of cells, the result may also be fatal.

BIOMEDICAL PROTECTION

Genetic and Immunological Methods:

The human race has existed for thousands of years constantly exposed to varying amounts of ionizing radiation, has adapted to a certain level of exposure, and has thrived. If we can discover

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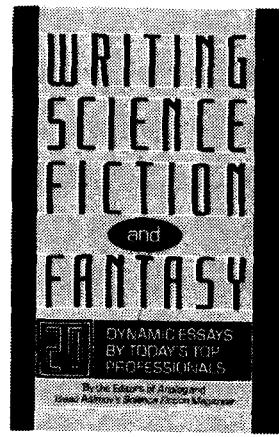

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the nature of the evolved factors and immunological mechanisms which provide us with our natural protection against ionizing radiation, there are several methods of applying this knowledge to enhance that protection.

First, the internally produced chemical factors responsible for our present level of resistance, and the gene or genes in human DNA associated with the manufacture of these chemicals must be identified. It might then be possible to reengineer human DNA to bring about an increase in the production of these protective factors, or perhaps these factors can be manufactured.

Recombinant DNA techniques may lead us to an even earlier solution. When the appropriate gene or genes have been identified, it may be possible to splice them into the DNA of a friendly bacterium, such as *E. coli*. These bacteria, with their altered DNA, could then be cultured and the anti-radiation factor (or factors) harvested for use in enhancing the radiation resistance of human tissues. This technique has proven quite successful in the treatment of diabetes mellitus with human insulin manufactured by altered bacteria.

Another possible approach would be to implant the new *E. coli* with the human anti-radiation gene directly into the human gastrointestinal tract where it normally lives. If the anti-radiation chemicals manufactured by the bacteria could be directly and continuously absorbed by the human intestinal tract, it would provide the desired anti-radiation protection over an extended period of time.

Longer-term protection might be achieved if a way can be found to produce active immunization to the ill effects of ionizing radiation. The passive immunity provided by the recombinant DNA methods might last for a few weeks to months, whereas active immunity might last for years or a lifetime. This is comparable to the difference between the lifelong active immunity produced by injections of tetanus toxoid as contrasted to the passive (three to four weeks) immunity conferred by an injection of tetanus antitoxin.

Pharmacological Methods:

Presently pharmacological protection from the ill effects of ionizing radiation appears to be one of the most promising approaches. As a direct result of the US Army's drug development program, the goal of using drugs to protect troops in the field from one of the harmful effects of nuclear warfare is rapidly becoming a reality. Several experimental drugs, designated WR-2721, WR-3689, WR-151327, and WR-1065, have been developed with varying degrees of effectiveness and toxicity. The various drugs, when used alone, provide only modest protection. Evidence suggests, however, that combinations of these drugs in lower doses will result in more effective and less toxic or even non-toxic radioprotection.[3]

The following criteria have been established for a satisfactory radioprotectant drug. It should reduce the ill effects of ionizing radiation by at least a factor of two, and increase by a factor of ten the dose of radiation necessary to render personnel ineffective. The protection should be relatively long-term

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(on the order of several days). The drug must be well tolerated biologically, and must not interfere with the performance of the individual. Side effects must be minimal with no cumulative or irreversible toxicity. Finally, it should be self-administered, preferably orally, have a shelf-life of at least two years and should not be abusable. The ideal drug would possess all of these characteristics and significantly exceed several of them.[3]

Based on data from experiments using the most effective radioprotectant drugs available, Army researchers are convinced that these characteristics can be realistically achieved using current drugs and state-of-the-art drug development technology.[3] This research is being conducted at Walter Reed Army Medical Center (the source of "WR" in the drug names) in Washington, DC, in an effort to protect troops on the battlefield who are under nuclear attack.

The generic name for WR-2721 is ethiofos in the United States, and gammophos in the USSR. At this time, WR-2721 and WR-1065 are the drugs which meet most of the criteria listed above. Most of our tissues can be well protected by WR-2721 and WR-1065, but both still need further improvement. They do not work as well when taken orally as they do when given by injection, and they provide little or no protection for the central nervous system.

Chemicals (drugs) and biological products, whether synthetically manufactured or produced by the cells of the irradiated tissues, work by inhibiting damage to the cells or by repairing such damage after it has occurred.[3] Several mechanisms have been proposed to explain the protection these drugs confer.

At the molecular level these radioprotectants work by removing various free radicals resulting from radiation-induced hydrolysis of water before they can damage the cells. The sulfhydryl components in some of these drugs provide hydrogen atoms to replace those which have been lost from biologically important molecules. The sulfhydryl radioprotectants also form disulfide bonds with thiol groups of proteins. This preserves the integrity of enzymes and structural proteins that depend on intact sulfhydryl and disulfide groups for normal biological functions.

Aminothiol radioprotectants can bind electrostatically to the sugar-phosphate structures of DNA. High concentrations of these radioprotectants can be built up at specific sites on critical molecules to provide protection where it is most needed. Reversible binding of polybasic radioprotectants to DNA inhibits the unwinding of the double helix due to breaks in connecting strands caused by radiation. This slows the rate at which the double-stranded helix of the DNA can be unwound for transcription and translation. The greater stability in the DNA increases the possibility that damage to the DNA will be repaired.

Radioprotectants may also cause physiological and biochemical changes that can ameliorate the damage of ionizing radiation. These changes, which include endogenously produced radioprotective substances, biochemical shock, hypothermia, and hypoxia, reduce cellular sensitivity. Biochemical shock alters liver function, synthesis of DNA,

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and replication and multiplication of cells. These processes give the cells more time to repair the damage to the DNA before the next round of DNA synthesis and cell reproduction. Hypothermia, a lowering of the temperature of the entire body, can be caused by several radioprotectants and may help in the protection of the entire body by lowering the metabolic level of the tissues, giving them more time for repair.

The relative importance of each of these mechanisms is not entirely understood at this time. However, chemical radioprotection probably involves some elements of most of the mechanisms described above.[3]

Current research activities are aimed at understanding these mechanisms. Recent studies[4,5] have shown that WR-1065 is an effective protector against radiation-induced double strand breaks (DSB) in DNA. However, it apparently neither aids nor interferes with the repair of the DSB. The repair of DSB in these studies was dependent on the pH at which the studies were carried out, but was not affected one way or the other by the presence of WR-1065. Gamma radiation (low LET) was used in these studies.

Previous studies[6] tested the protective ability of WR-151327 against sources of both high and low LET radiation, using WR-2721 as a benchmark for comparative purposes. Results from these and other studies[7,8,9] show that most chemical radioprotectants are more effective protecting tissues from low LET rather than high LET radiation. WR-2721 and WR-151327 are both adequate in protecting DNA against the effects of low LET radiation, whereas WR-1065 is significantly more effective in protecting DNA against the effects of high LET radiation.

APPLIED PHYSICS AND ENGINEERING PROTECTION

Many efforts aimed at protecting humans from radiation have had their basis in applications of physics and engineering. Two approaches that have received attention are mass shielding and magnetic shielding.

Mass Shielding:

The classic approach to protecting biological organisms from the effects of ionizing radiation is to use a mass shield. If enough matter is placed between you and the source of radiation, you can achieve any degree of protection desired. How much mass is "enough" depends on a variety of parameters including the type of radiation and the material used to make the shield.

A relatively thin shield of a material with a high density can achieve the same effect as a thicker shield of a material with a lower density. A lead barrier designed to achieve a given degree of shielding can be significantly thinner than a barrier made of soil. Unfortunately, since mass is the product of density and volume, thinner does not necessarily mean less massive. In fact, the mass of the shielding is nearly independent of the material used.

The use of mass shielding has been seriously considered for orbiting space habitats.[10] It has also been used in a number of science fiction stories for

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both space stations and mobile interplanetary vessels. For example, powdered Moon rock encased in aluminum was used along the outer rim of Janus in James Hogan's *The Two Faces of Tomorrow*. Heinlein envisioned a shielded shelter in the center of his interplanetary torch ships in *Podkayne of Mars*.

For any of these applications there is a complicating factor that must be considered. The thickness of powdered Moon rock required to protect occupants against heavy primary radiation (particles with higher atomic numbers) would be about 50 cm.[10] When these heavy primaries collide with dense matter they break up into a much larger number of lower atomic number particles which are traveling at a significantly lower velocity. The net effect of a shield of this minimal thickness would be to greatly increase the total ionizing potential of the radiation. To protect the occupants completely from these effects, the shield of lunar surface material would have to be about two meters thick. (Hogan used four feet of powdered Moon rock plus an unspecified thickness of aluminum skin on the outside and construction material on the inside to achieve this same effect in Janus).[11]

Since the galactic cosmic rays are essentially omni-directional, an orbiting habitat must be shielded from ionizing radiation from all directions. For a nominal shield thickness of 2 m, a shield completely surrounding a spherical volume would have a shell volume given by:

$$V_{shell} = \frac{4}{3} \pi (6r^2 + 12r + 8).$$

For the same shield thickness, a shield completely surrounding a cylinder with an aspect ratio of 10 (i.e., length = 10 radii) with end caps would have a volume of:

$$V_{shell} = 4 \pi (11r^2 + 14r + 4).$$

From these equations it is clear that, regardless of whether the protected volume is a sphere or a cylinder, for large radius (r) the volume of the shield (and thus its mass, since $m = \rho V$, where ρ is the density) increases roughly as the square of the radius of the protected volume.

The mass of the shield is a penalty that must be paid each time the mass is accelerated. For a habitat the problem is primarily one of moving the mass required to the assembly point. The penalty, in terms of energy required to accelerate the material, is paid only once. Of course it's not quite that simple. The mass would have to be accelerated as spin is applied to the habitat to provide artificial gravity, but once it is spinning at the proper rate, it will not be stopped and restarted frequently.

For a moving ship intended to undergo acceleration as a matter of course, it is entirely a different matter—a matter controlled by Newton's **F = ma.** Every time the vehicle is accelerated the mass penalty is paid. Using mass shielding for a habitat can make sense under the proper circumstances. Using mass to completely solve the shielding problem of a mobile space vehicle simply doesn't make sense.

Magnetic Shielding:

The problems of using a mass shield for a space vehicle are well known. One

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alternative under study is magnetic shielding.

Cosmic radiation is basically a plasma—a fluid of charged particles. The concept behind magnetic confinement for fusion reactors is to build a magnetic container to keep the plasma in. In its simplest form, the idea of magnetic shielding for a spacecraft or habitat is to build a magnetic container for personnel that keeps the plasma out.

Charged particles interact with the magnetic field through which they are moving via the Lorentz force. This force is proportional to the magnetic field strength (**B**) and the component of the particle velocity vector (**v**) that is perpendicular to the magnetic field. In the absence of an electric field, the Lorentz force (in mks units) is given by:

$$\mathbf{F} = q\,\mathbf{v} \times \mathbf{B}.$$

where q is the charge on the particle and "×" indicates a cross product of the vectors **v** and **B.** Because of the cross product, the force **F** is in the direction perpendicular to both **B** and **v.** The net result, if the velocity is not too high, is that the charged particle is caused to spiral around a magnetic line of force. At higher velocities the particle would not be captured and spiral around a field line, but it would be deflected into a new trajectory.

The simplest form of magnetic shield would be a dipolar field, such as that created by a current loop (Figure 2).

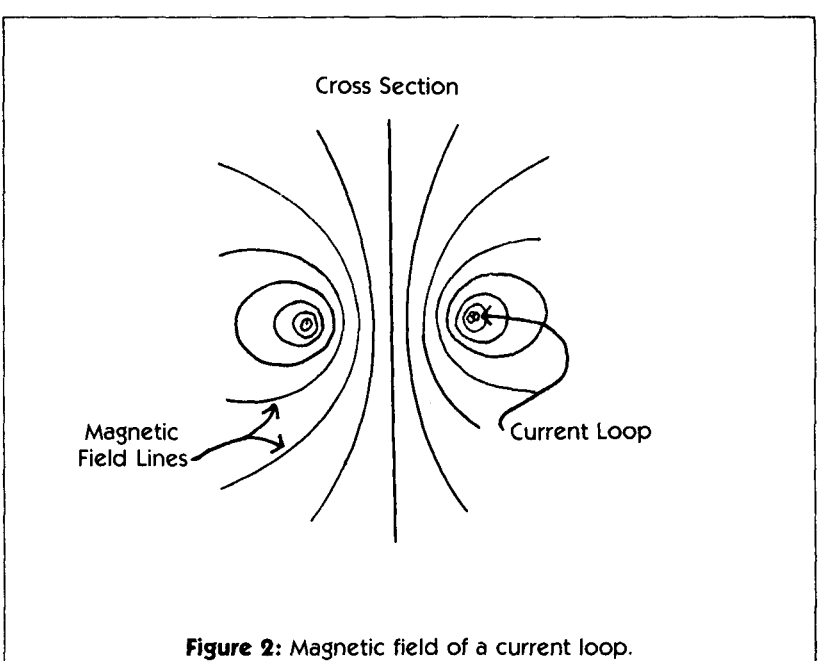

Figure 2: Magnetic field of a current loop.

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Since the more-ionizing, slower-traveling particles will tend to spiral around the magnetic field lines, it becomes clear that for a single current loop, the place to be is near the loop. This simple arrangement has a drawback in that the living/working quarters located next to the current loop would experience a significant magnetic field. Although this is not that much of a direct concern for personnel, it is a significant problem for any equipment that uses magnetic materials or electrical circuits.

An interesting approach to circumvent this problem[2] would be to use a toroidal living space with superconducting conduits or coils surrounding it, and carrying current parallel to the toroid's circumference (Figure 3). By symmetry there is almost no magnetic field within the torus. This is equivalent to placing the living quarters inside a toroidal tube and passing the current through the skin of the tube.

This concept can be extended to include more space within the shield by considering a solenoidal field generated by pairs of current loops spaced along

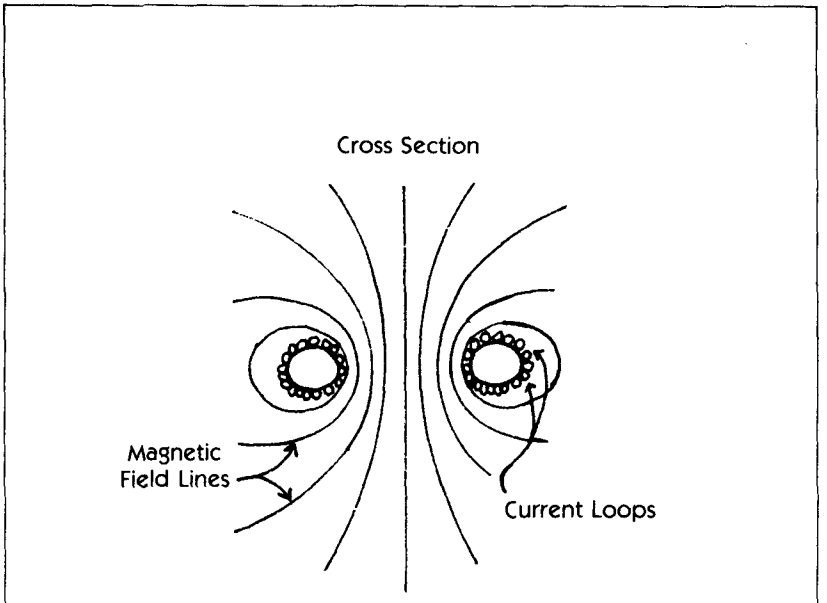

Figure 3: Magnetic field of current loops on the surface of a torus.

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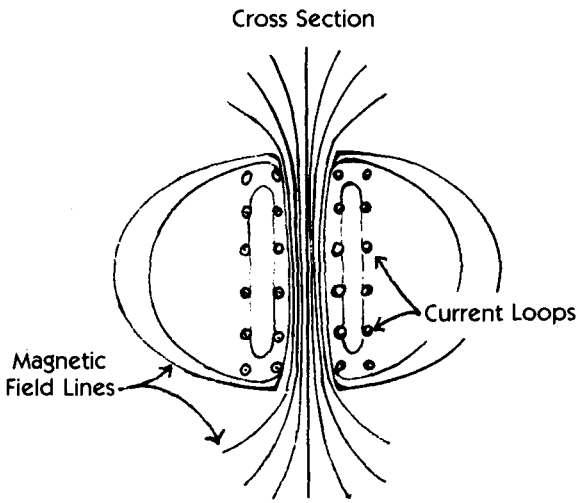

Figure 4: Magnetic field of current loops on the surfaces of a cylindrical shell.

the inner and outer surfaces of a cylindrical shell (Figure 4). Again, by symmetry, the magnetic field strength within the living/work area is minimized. In this sketch the coil pairs are shown to continue above and below the living/work area to minimize the edge effects experienced in the work area as the ends of the finite length solenoid are approached.

The most practical material from which to make the current coils is probably a superconductor. At the time of the original suggestion (1977) an operating temperature of 9K was assumed. At that time most of the recent advances in ceramic superconductors had not yet been made. Within the last two or three years superconductor technology has improved to the point where practical superconducting current loops can be readily foreseen which would operate at the temperature of liquid nitrogen (77K). At this time, superconductivity has been documented reproducibly at temperatures of at least 63K. This significantly reduces the problem of dumping unwanted heat into space.

Since the force applied to the particles is perpendicular to both the velocity vector and the magnetic field, one advantage of using a superconductor to generate the magnetic field is that no power is needed to maintain the current. Power is required for the initial build-up of current in the loop, and to cool the coils.

Now consider the effects of the mag-

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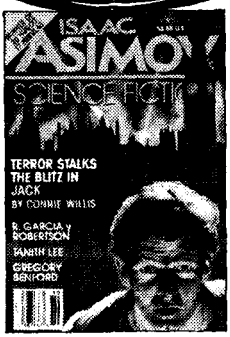

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netic shield in light of the physical characteristics of cosmic rays. First, recall that the Lorentz force is applied in a direction perpendicular to the particle's velocity, so it changes the particle's trajectory but does not slow it down. This is good, since the ionizing power increases with decreasing velocity. Second, the slower particles will tend to spiral around the magnetic lines of force while the faster particles will be deflected into new trajectories, but will not be "captured." There will be greater control over the path followed by the more dangerous low velocity particles than over the less ionizing high velocity particles. Third, the strength of the magnetic field is a function of the current in the loops. It may be possible to maintain the current at a lower level for a majority of the time, and increase the current, and thus the field strength, during solar flares.

One feature of the magnetic shield that is perhaps less than desirable can be seen by examining the acceleration of a particle acted upon by the Lorentz force. The force applied to the particle is proportional to the charge. This would seem to be good, since the force would be greater on particles with higher atomic numbers (assuming complete ionization). Unfortunately, the acceleration applied to the particle is equal to the applied force divided by the mass:

$$\mathbf{a} = \mathbf{F}/m = (q/m)\ \mathbf{v} \times \mathbf{B}.$$

As a result, the acceleration of the particle decreases as atomic number increases because the mass of the particle increases at a faster rate than the charge.

It would be useful to study the effect of the orientation of the dipolar or solenoidal field with respect to the directional component of the cosmic radiation—the solar wind. The axis of the Earth's field is oriented (almost) perpendicular to the direction to the Sun. The toroidal living/work space might be best protected with the axis of the field oriented toward the Sun. This would minimize the deflection required for particles from the solar wind to follow the magnetic field lines. During the majority of the flight, when the ship is not under acceleration, it could be oriented to achieve this effect.

There may be more that can be borrowed from research on magnetic containment of fusion reactions. In a tandem mirror reactor[12], a combination of a magnetic mirror followed by an electrostatic mirror are used to plug the ends of the "bottle" and confine the plasma inside. Two possibilities are suggested by this. First, we should consider providing an electrostatic shield immediately around the living/work space in the ship within the magnetic shield, to deflect particles that penetrate through the magnetic shield. Second, it is possible that the interaction of the magnetic shield and the solar wind will build up zones of charged particles in the field around the ship that will act as an electrostatic shield.

A good model for the types of interaction that will occur between the magnetic shield and the solar wind is the interaction of the solar wind with the Earth's magnetic field. Although the details of this interaction are beyond the scope of this article (interested readers are referred to *The Earth's Magnetotail,*

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by E. W. Hones, Jr.[13]), some general comments should be made. A magnetic shield that is maintained for an extended period of time (e.g., on a minimum energy orbit to Mars and back), the entire range of phenomena, from the formation of a magnetotail, plasmoids and magnetic substorms, to Van Allen belts might occur.

Conclusions

We've discussed several ways to protect the occupants of space ships, space habitats, and colonies on the Moon and Mars from the serious and possibly lethal effects of ionizing radiation. The method or mixture of methods that will be used will depend on the particular application. For mobile ships, a combination of biomedical protection and a magnetic field might be the most reasonable and economic solution. For a space habitat, the use of mass for shielding might make more sense. We will probably end up with a combination of three methods of protection:

- A magnetic shield to divert the charged particles, ("Energize the shields, Scotty!")
- Biomedical and pharmacological protectants for the crew and passengers ("Pass out the pills, Bones!"), and
- Mass shielding where absolutely required, or where its use is dictated by economic considerations. ■

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References

1. Unsold, A., *The New Cosmos*, Heidelberg Science Library, Springer Verlag, New York, 1969.
2. Hannah, E. C., "Meteoroid and Cosmic Ray Protection, in Space Manufacturing Facilities (Space Colonies)," proceedings of the Princeton/AIAA/NASA Conference on Space Colonization, edited by J. Grey, published by the Am. Inst. of Aeronautics and Astronautics, March 1977.
3. Giambarresi, L., and A. J. Jacobs, "Chapter 14—Radioprotectants," *Military Radiobiology*, Armed Forces Radiobiology Research Institute, Bethesda, Maryland, 1987.
4. Sigdestad, C. P., et al, "The Effect of 2-[(aminopropyl)amino ethanethiol] (WR-1065) on Radiation Induced DNA Double Strand Damage and Repair in V79 Cells," *Radiation Research*, Feb. 1987.
5. Grdina, D. J., and B. Nagy, "The Effect of WR-1065 on Radiation Induced DNA Damage and Repair and Cell Progression in V79 Cells," *Br. J. Cancer*, vol. 54, 1986.

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6. Sigdestad, C. P., D. J. Grdina, A. M. Connor, and W. R. Hanson, "A Comparison of Radioprotection from Three Neutron Sources and Cobalt-60 by WR-2721 and WR-151327," *Radiation Research,* vol. 106, Jan. 1986.
7. Giambarresi, L. I., et al, "WR-2721 Inhibition of DNA Synthesis in Rats Following Partial Hepatectomy," *Fed. Proc. Am. Soc. Exp. Biol.* 3, 681, 1965.
8. Sigdestad, C. P., et al, "The Effect of S-2-(3-aminopropyl-amino) ethylphosphorothroic acid (WR-2721) on Intestinal Crypt Survival I—4MeV X-Rays," *Radiation Research,* vol. 62, 1975.
9. Sigdestad, C. P., et al, "The Effect of S-2 (3-aminopropyl-amino) ethylphosphorothroic acid (WR-2721) on Intestinal Crypt Survival II—Fission Neutrons," *Radiation Research,* vol. 65, 1976.
10. O'Neill, G. K., *The High Frontier,* William Morrow and Co., Inc., 1977.
11. Hogan, J. P., *The Two Faces of Tomorrow,* Del Rey, Ballantine Books, 1979.
12. Conn, R. W., "The Engineering of Magnetic Fusion Reactors," *Scientific American,* Oct. 1983.
13. Hones, E. W. Jr., "The Earth's Magnetotail," *Scientific American,* March 1986.

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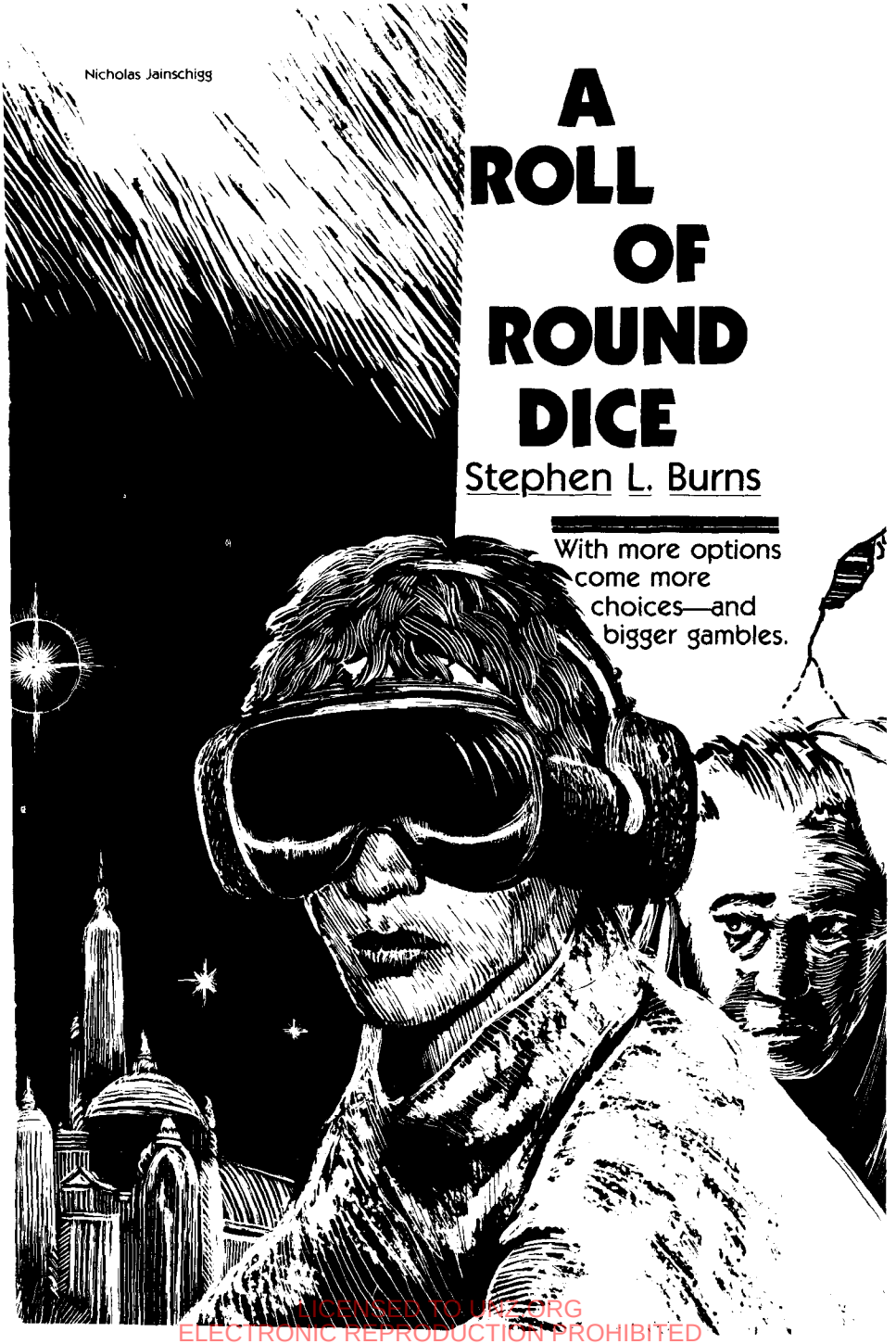

A ROLL OF ROUND DICE

Stephen L. Burns

With more options come more choices—and bigger gambles.

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Walt Roxbury patted the package in his coat pocket as he got out of his car, something he'd done at least twenty times since leaving the store. Still there.

A good thing, too. If he lost it he might as well get back in the car, back out onto the street, start driving, and not stop until the car died. Which might not be all that far, considering the shape the batteries were in.

Glenda was going to go critical when she found out what he'd done. No question about it. He couldn't even blame her. Aside from the fact that he might be making one of the biggest mistakes of his life there was, as always, money. The car was on its last legs. The house needed repainting, a new roof, and a dozen other repairs. So many things were falling apart. . . .

Walt considered himself a cautious, deliberate man. Mr. Responsible. The kids at the high school where he taught history called him "The Rock" behind his back.

A mordant smile crept onto his face. Well, kids, he thought, The Rock just ran his charge card out to the point where it almost glows in the dark. On a wild-hair hunch. The Rock is putting all his chips in the pot, closing his eyes, and rolling a pair of round dice on one make or break gamble.

On his way to the front door he spotted Sandy Remington from just down the street. He paused to watch her, gazing out across the dead brown lawn. She and a tall, lanky boy ambled along the cracked and heaved sidewalk arm in arm. Both wore the drab, shapeless clothes of Virgins.

He had known Sandy since she was knee high. She was his son Howie's age, they had even dated a while. He remembered what pretty blue eyes she had. Eyes the color of a summer sky. How long had it been since he had seen them? Not since she graduated and went totally Virgin.

Now all you saw was the blank black plastic and glass of her Spex. They covered her ears, eyes, eyebrows, and the bridge of her nose, giving her an alien, mantislike appearance. The boy wore Spex as well, but judging from his acne-scarred cheeks he wasn't hiding a face as pretty as hers.

He found himself wondering what they saw in each other. How did she look to him? Did her skin have the iridescent shimmer of oil on water? Did he see her nude, covered with peacock feathers or silver scales, and wearing the face of a pop star?

Almost as if she had heard his thoughts, Sandy turned her head to stare at him. Her exposed lower face gave away no hint of what might be passing through her thoughts. Again he wondered what image was painted on the wrapscreens inside her Spex. A troll lumbering toward its cave? A faceless blob shaped out of zeros?

She looked away, hidden eyes front again. They reached the end of the block and turned the corner, continuing on their trip through whatever endless Oz they were creating around themselves.

Walt sighed, feeling depressed. Who could blame them for choosing the endlessly mutable fantasy world the Virgins called the Real, over the grimy concrete reality behind the computer-mediated veil of glamour? Why trust the mind to filter out the litter-covered, crumbling

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asphalt street lined with stumps of dead trees and sixties suburban dream houses that might still be standing after the millenial, but looked like they had lost their dreams somewhere along the way?

Everybody wants a better cleaner prettier happier world.

He knew he did.

Howie went up the tessellated gold walk, past the glittering lawn of singing emerald crystals, and used his four silver keys to let himself through the iron-bound front door. Once inside the alabaster-walled front hall he heard his mother call.

"*Howie? Is that you? Supper's ready!*" A running 'digm made his mother's voice sound hollow, electronic; the blare of the license plate number of a car with its lights left on at the mall.

His number. He could still slide it or skip, but it wouldn't be worth the static. It might be his birthday, but it would have to be done by her 'digm. It was all one big dent in the Real.

Well, he could jam it out.

Purple, he voked as headed toward the dining room. The world melted before his eyes, inside his Spex, lapping into the chosen Real. He passed through the opal-walled hallway, into the vast dining room with its night sky ceiling and erotic Old Masters on the burgundy brocade walls. The dining room table and chairs were shaped out of frozen fire, the light they emanated glinting off the gold place settings. His father was already at the table. Reading a book, no separation between head or hands and pages.

"Happy birthday, Howie," his mother called as she came in from the kitchen. Wicked Witch of the West with a plastic smiley face and flowered apron. Howie blinked and voked. She melted into Lotus Breeze, voluptuous and dangerous, but that didn't fit so he rolled her back, minus the mask this time.

"Thanks Mom."

"Sit down," she cackled, indicating his place with a spindly finger. There were heavy leather straps on the chair.

"OK."

His father put aside his book when he sat down. "Happy birthday, Son." Words still crawled across his face like ants looking for a place to nest.

"Thanks, Dad." His dad was a wax dummy whose mouth never moved when he spoke, like a talking mannequin at the mall. Not that he ever said that much. Talking was his mother's job, and she never seemed to punch off the clock either. At least when he was around. Dad always had his nose buried in a book, which he supposed was sort of a stone-age Real when you axed it.

"I made all your favorites for dinner," his mother cawed, knobby fingers clutched around a tall diamond tumbler filled with blood. She took a sip and smiled at him. Red dripped from her pointed teeth and thin blue lips.

Howie keyholed in on the plates in the middle of the table. Honey-garlic pork ribs. Fried rice. Egg rolls. All homemade, not some soysoid take-out. You are what you eat. She figured if she fed him his kid favorites that's what he'd become.

"Looks great, Mom." It could be worse. A lot of Virgins's folks had thrown them out. They let him live here

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as long as he helped out on the bills a bit, and he pretty much came and went as he pleased. Oh, there was his mother's static, but that was easily tuned out.

This little family 'digm was no big deal. He could beave it for an hour. Woof up some eats, collect the birthday goodies at the end, and still get to the Twitchin Link before the circuit really warped it.

"Thanks, hon." She settled her black-clad, scarecrow body into her chair and took another drink. "Dig in before it gets cold."

Walt ate slowly, methodically, covertly watching his family.

Glenda was right into it. Her glass was full of straight gin, and he knew for sure it wasn't her first of the night. He could tell by her forced gaiety, the bright feverish look in her eyes.

He knew her cycle. She spent four days a week in the little home office set up in their guest bedroom, taking billing complaints for Unitilities. For quite a while now she had needed a little something to help her get through the afternoon. More something as the week wore on.

It was still early in the week, but she was like this tonight because Howie's birthday had her all nerved up. It helped her see what she wanted to see. One big happy family. Her son the way he had been when he was fifteen, and she was still on the soft side of forty.

As for his son . . . who knew what he saw through his Spex? That was always the question. What do you see when reality is whatever you want it to be? When your made-up world is the *Real* and everything else simply isn't.

What does he see when he looks at me? What does he make of me? A ghost? There were times he felt like that was what he'd become. A silent hazy presence whose hand slid through them every time he tried to touch their lives.

"Got hot plans for tonight, Son?" he asked.

Howie looked up from his plate, his half-covered face unreadable. "Just going to the Twitchin Link for a while."

"Ah," he said, making the same noncommittal sound he made when one of the kids told him the computer ate their homework. That or the dog. The Link was a Real bar.

Thousands of years of social change and yet the Father's Constant remained worry. Not that many years ago he would have worried about Howie going out and getting into trouble with alcohol or drugs. At least those two could be put aside—not that the Worry Quotient was any smaller.

The main attraction at a Real bar wasn't cheap pitchers or a nearsighted age-proofer. The main attraction and reason for a fairly steep cover charge was what the Virgins called a *boost.* A mainframe computer large and fast enough to circuit a hundred or more personal realities into a Deep Real; one overarching reality made and maintained by those inside it. The processor/transponders inside their Spex could manage that for five or six Virgins, but more than that and you need a boost.

Some Virgins—Howie for instance—aspired to be Stars, their own Real so deep that it became the informing 'digm for the whole Deep Real.

To be in circuit took control and clar-

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ity of thought. Most of the refreshments would have passed muster at a church social. The bar served alcohol, but few of the customers would dull themselves with much more than a single glass of wine or beer. Can't be a Star if you lob out.

Speaking of lobbing out. He glanced at Glenda, pushing her food around her plate and looking lost.

"You need some, um, money for tonight?"

Howie shook his head, light gleaming off black plastic. "I'm OK. Just got paid."

No college for Howie, even if they could have afforded it. He worked at a Real fast food restaurant at the Mall. Bland assembly-line food served in a place that was nothing but white plastic and battered Formica to the naked eye, but boosted to a glittering fantasyland for the Virgins.

"That's good." God, he sounded so lame. He desperately wanted to talk to his son, *connect* with him. So did Glenda. The difference was, she didn't understand why she couldn't, and he understood all too well. Not that it helped. Knowledge might be power, but understanding was powerlessness.

Still, he kept trying to break through, hoping to avoid the gamble. "I saw Sandy Remington today."

Glenda's head came up. "Such a pretty girl."

Howie's upper lip curled in distaste. "She's a mudpup."

"A what?" Spending as much time with kids as he did, Walt was up on most of the slang. School rules forbade wearing Spex on the grounds, but the culture leaked in. This was a new term.

"A mudpup," Howie explained patiently. "She can't come up with a half-decent Realself, so she wears the one her boyfriend jams on her."

"Such a pretty girl," Glenda repeated. "I remember when you two went to the Junior Prom together." Her gaze grew faraway, looking back on the days when she misunderstood her son no more than a mother ever did.

"Grayzone Queen," Howie pronounced, dismissing Sandy—and maybe even his mother—all at once.

And that's the truth of the Real, Walt thought. In the Real you were whatever image you could make and maintain. In the Real bright, pretty Sandy was a mudpup, and his heartbreakingly average son could be a Star. Satisfied to work the grill at a grungy burger joint. His highest aspiration to be the bright light in a dingy warehouse full of kids who think the world is as beautiful as they want it to be.

Walt pushed his plate away and looked around the table. Glenda was in her artificial world and Howie in his. One made out of alcohol and self-delusion, the other spun out of computer mediated senses. Him in the middle, watching them drift apart. Worlds apart.

What was his dreamworld?

One where he still had his wife and his son.

Nothing to lose. Time to roll them bones.

He cleared his throat. "I think it's time to bring on the presents," he said with a false heartiness.

Howie watched his mother jump up,

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the odd jerky way she moved making him jam her into a limp-stringed puppet, a smile painted on its face.

"Open mine first," she cried, getting a brightly wrapped package from the carved ebony sideboard. She handed it across the table and sat back down. "Happy Howieday, baby."

"Thanks Mom." He forced himself to smile, even though he was planning to be disappointed. She took a drink and watched over the rim of her glass as he opened the package, black holes for pupils in her wide painted eyes. He keyholed in to see whatever she got him was.

"Hey, this is really great," he said unenthusiastically, holding up the leather jacket he found inside the box. It looked expensive, probably costing at least a couple weeks' salary. Maybe more, since it felt like real leather.

Of course it wasn't anything he'd ever wear. She just didn't understand that glamming your Realself into a jacket like this was gigastyle, but actually wearing one made you a zoner. That was the problem. She still saw him as a kid, and a zoner to boot.

He put it aside. "Thanks Mom."

"My turn now," his father said quietly. Howie turned toward him. There was no way to predict what his dad might have gotten him. There were times when it seemed like he really axed the Real, maybe even wanting to tap in himself.

"I hope . . . this is all right," he said, holding out over a small matte black plastic box.

Howie took it, a disquieting something in his dad's voice almost making him keyhole in on his face. For some reason he'd never pegged his dad's voice to a 'digm. Maybe because it had never become a series of recordings the way his mother's had. The strange thing was, he sounded almost . . . scared?

He keyholed in on the box as he opened it. When he saw what was inside he was taken so off guard that the breath caught in his throat and the Real flickered and fuzzed over.

Laid out before him on the black foam padding was a full Mentaki Set. Resting in two cuplike depressions and gazing back up at him were a set of gleaming glass and silver eyes. The other padded compartments held the rest of the Set: the earbuds, hair-fine 'sponder loop, subcute power and processor pack. Everything he needed to put his Spex aside and plug directly into the Real.

He licked his lips, not knowing what to say. A Mentaki Set was something he had wanted so badly he hadn't dared dream of owning one for fear he'd come to hate his Spex.

There was a crash that jerked his gaze up from the Set. His mother had dropped her glass. A sharp, astringent, unbloodlike smell filled the air.

She stared at what his dad had given him, painted eyes looking like they might fly out of her head. "*Walter,*" she shrilled, her tone as sharp as the glittering fragments scattered across the table. She pointed a shaking finger. "Is that what I think it is?"

"It is," he answered mildly.

"*You bastard!*" she shrieked, fingers hooking into claws. Apple-red spots bloomed on her cheeks. "*You stupid, thoughtless—*"

"Shut up." His father's voice was

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soft, and yet so forceful that she did, standing there staring at him with her mouth gaping open. Howie blinked inside his Spex, almost losing the Real in his confusion.

"Go fix yourself a fresh drink, then come sit down and be quiet," he went on in that low, irresistible voice. She twitched as if being overridden by remote control, ratcheted to the ebony sideboard and began filling a fresh glass from a golden ewer.

Howie swallowed hard when his father turned back toward him, but when he spoke his tone was gentle.

"Well, Son, what do you think?"

"Dad, these are . . . " He shook his head. He knew to the penny what a Mentaki Set cost. More than he made in a whole year. More than his father could afford on a teacher's pay. Not only that, he knew his dad didn't approve of him being so into the Real. So why had he given him a Set?

His mother came back to the table. She sat there drinking and mumbling under her breath. Painted tears ran down her cheeks.

His father ignored her. Howie could feel the weight of his gaze even through his Spex.

"I want to ask a favor, Son," he said at last.

"Sure," Howie answered uneasily.

"That Mentaki Set is yours to keep if you want it. No strings. *But,*" he took a deep breath. "I want you to take off your Spex for me."

"You mean *now?*" This was almost too much to handle even with the Real. Jaron only knew what it would be like raw.

A slow nod. "Yes, son. Right now. Just for a few minutes."

"Why?" It just didn't pute. First he gives me a Set, then he wants me to take off my Spex.

"Do I need a reason?"

Howie shrugged. "I guess not."

He reached up to remove them. The whole thing made him feel gigaweird, like he was undressing in front of them. Part of him wanted to resist, to stop and say no. But his father had never asked him for much, and laying that Set on him earned him a favor or two. Beyond that was some other reason he couldn't quite axe.

He tabbed the lock in the back. The Spex hinged open on both sides. Cool air rushed across his face, making him blink. He laid them on the table within easy reach. "All right?"

"That's fine, Son."

He stared at his father expectantly. But all he did was sit there, looking back and acting like he was waiting for something to happen.

Howie searched his face for a clue to what he wanted. Instead, he found himself noticing that the old man looked, well, *old.*

How long had it been since he had looked at him without his Spex on? At least a year. Maybe two. But how could that short a time have stolen all his hair or put such pouches under his eyes? And why did he look so scared? What did he have to be afraid of?

"I can see your eyes. . . . " His mother's whisper drew his attention, and when he looked at her he blinked in surprise, and just barely catching himself before asking what had happened to her.

Her face was harshly thin and yet

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somehow puffy. There was an unhealthy yellowish cast to her skin. Her eyes were smudgy and bewildered looking, and she stared at him like a Real that wouldn't stay in focus.

With a sudden chill he realized that she was drunk. He remembered the smell from the glass she dropped. Alcohol. How had she gotten like this, he wondered, turning away because looking at her made him feel sick. Partly at the way she looked, but mostly because she'd gotten that way without him knowing it.

All that left for him to look at was the dining room. The table was cheapo pressed wood, not crystallized fire. The golden plates were clunky chipped china. The sideboard was the same pressed wood as the table, not carved ebony. Instead of velvet, the walls were covered with stained and faded wallpaper. The whole room looked small and tired. Just like his parents.

He felt trapped and fooled. Betrayed. It was like being caught in a crash, when the gigaReal dreamqueen you were in circuit with accidently let her Realself slip, and you found yourself linking with a lumpish blob with green teeth, a face like a pizza, and a voice like fingernails on a blackboard.

"Son?"

"Yeah." He kept his hand on his Spex, reminding himself that the Real was still within reach.

"Like I said before, that set is yours to keep if you want it." His mother started to interrupt but he silenced her with a single glance. Howie had never seen him like this before. Not just the aswas, but this strong and commanding. This determined.

"But I hope you don't."

Howie bit his lip. "Why not?" Why give me something he doesn't want me to have? It didn't make sense.

"Because you'd never see us again."

He tried to axe what his father was saying, but couldn't. "I see you all the time."

"Do you?" Dad leaned closer. "Do I look different to you without your Spex?"

"Yeah, you do." Even more every time he looked. All the more reason to put them back on. Right now. But somehow he couldn't. Not yet.

"That's because you're seeing me as I really am. I'm getting old. My hair is falling out. I spend half of my time worrying about money and the other half worrying about you and your mother. My face shows it." His voice dropped lower. "Now look at your mother. Tell me what you see."

Howie didn't want to. The more he looked the more he saw, and the less he liked it. But something about his father's voice and attitude compelled him to obey.

"She looks old, too," he whispered. "Maybe even sick."

"She's a *drunk*." She stiffened as if those words had been a slap, clutching her glass tight and her face screwing up in shame and pain. "Alcohol is her Spex, Son. She has a rotten job, listening to people bitching all day long. She sees herself getting old and every dream she ever had turning to shit. Her job's an ugly dead end, but we need the money to get by. The house is falling apart. The car is falling apart. Worst of all, our family is falling apart."

Howie's gaze was drawn back to his

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father, away from his mother's forlorn face.

"Maybe that's what's hardest to take, Son. The thing that makes her hide in her drinking and me hide in my books and my silence. Seeing you every day and knowing you don't see us."

"But I do see you! I do!" He wanted to scream it, but all he could do was whisper.

"No, son, you don't. We're mud-pups to you, with no way to change what you see when you look at us. You see what you want to see. We all do. We have to. But now and then we have to look long and hard at what is. We'd have to be blind not to. That, or past caring."

His father sighed, and somehow that sound was scarier than a growl or a scream or anything else Howie could imagine. In the Real it would have been the color of frozen blood.

"Take that Set if you want. Take it with my blessing, because I'm not going to say that what you're doing is wrong or bad. God knows the present is ugly and the future looks grim. You have your escape. I have mine. Your mother has hers. I just wanted us all to stop for a minute, understand where we are and where each one of us was going, take one last look at each other, and . . . " He shrugged and spread his hands.

Howie didn't want to know but he had to ask, he was caught in this terrible circuit until it broke. "And what?"

His father's face twitched into something like a smile, into an expression that would haunt his dreams for many nights to come.

"And say good-bye."

* * *

There. Walt thought, feeling nothing but emptiness as he watched his son sit there looking scared and confused. No way to blame him for that. I just shattered his world.

He tried to rationalize it by telling himself that sooner or later Howie would have come up against a situation like this. A hard place where the Real and reality couldn't be reconciled. A NeverNever Land where Peter Pan gets blown out of the air like a clay pigeon, gutted by Captain Hook, or run over by the steel wheels of the Little Train That Could.

Being a Virgin was in its own peculiar way as insidious as being hooked on drugs. Just like the hippie culture of the nineteen-sixties, it had a seamy side. Spex were expensive. Real bars were expensive. Even Virgins had to eat. Drug taking might not mix with the Real, but dealing could and did. So did theft, prostitution, and a number of other old sins.

Some parents forced the issue by throwing their children out. Others took their Spex away. But all too often those kids ran away to join those already dispossessed, and did whatever they had to do to get by. To keep the Real, which was all they had left.

Howie was a good boy. Walt was pretty sure he was capable of seeing how far astray the Real could lead him. So he had gambled everything on what the boy would do if he really saw. That he cared. Rolled those glass and silver eyes like dice. . . .

When Howie closed the black plastic box a tiny glowing coal of hope he'd managed to keep inside brightened to a small flame.

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"Take this back. Please." he said hoarsely, looking near tears.

It was all Walt could do to keep his voice even. "You're sure, Son?"

The boy nodded, and Walt realized that he might just be looking at a man now. "I'm sure." He hesitated, searching for words. "I mean, I'm going to keep my Spex. I'm not going to give up the Real. But . . . "

Walt waited. Glenda's hand crept over and covered his. He clasped it tightly. Two eyes. Two dice. Two gambles. Everything in the pot.

"But I'm not going to give you up either." There was no missing the plea on his face. In his eyes. In his uncovered eyes. "I can have both, can't I?"

He smiled at his son. Proud of him. Loving him. "It's your birthday, Son. You can have anything you want. You've still got your Spex. We're here for you. We always have been, and we wouldn't want to be anywhere else."

Time to let things be, to give him a chance to digest the new shape of his world. "But if I'm not mistaken," he continued, "*You* ought to be somewhere else. Like out celebrating with your friends, instead of hanging around with the old folks. Party's over. On your way."

"OK." Howie picked up his Spex as he stood. He did want to get away for a while, to try to get all this straight in his head. But some strange impulse sent him around the table to kiss his mother on the cheek.

"Thanks Mom," he said softly, not beaving it this time. She stared back up at him, looking surprised and grateful. There was something else in her face, something that told him she might have some things to get straight in her own head, too.

His father offered his hand. "Have a good time, Son."

Howie shook it, then fled the small, dingy dining room, his Spex clutched in his hand.

When he closed the front door behind him he saw that he hadn't escaped anything. He stood there on the stoop, gazing around at the dilapidated houses, the potholed street, the dead grass on his own front lawn.

He put his Spex back on, voked, and transformed it to the vista of fairy-tale castles on a street of gold that he knew so well. The crystal lawn sang to him in welcome. He took a deep breath and went down the steps into the rainbow-hued night.

But somehow it wasn't the same. Every facet of the Real he saw made him wonder what he wasn't seeing. What he might be missing. What might even be dying before his unseeing eyes.

Happy Howieday. Not an hour ago he hadn't felt any older. Now he did, and with it came a strong but hard to axe feeling that even though his father had taken something from him, he had in turn given him a gift even more precious than that Mentaki Set, and more beautiful than the deepest Real.

When Walt heard the front door close he picked up the Mentaki Set and slid it back into his pocket. He might not get a full refund, but he didn't give a damn. It had been worth every penny and more.

"Am I really an old drunk?" Glenda whispered, her face and voice over-

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flowing with despair. "Is that what you see when you look at me?"

He pulled her to him, held her tight. "No, love, it's not."

He stroked her hair, holding her as she began to cry. It was true. You didn't need Spex to see what you wanted to see. Sometimes you even needed that illusion to face yourself in the mirror.

The trick lay in knowing when to put all that aside, to face things as they really were. Otherwise there was no starting point for making what you wanted into a reality.

At that moment what he saw was a chance for things to get better. A fresh start born of a fresh look. A new way of looking at each other and themselves.

All won on the roll of a pair of glass and silver eyes. ■

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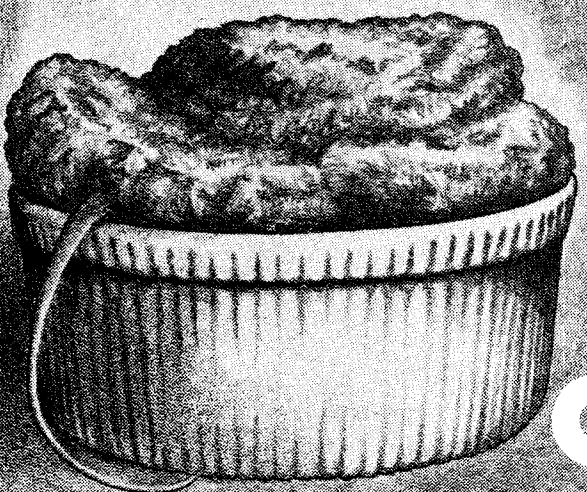
Aren't you glad nobody's *really* doing anything like this? Are you *sure?*

Jerry Oltion

THE SCENTS OF COMPULSION



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There were rats in the soufflé again. Karen realized it the moment her brother-in-law, Doug, lifted the bowl, but she suppressed the urge to scream a warning or to snatch the bowl away from him. The meal was ruined anyway; she might as well get *something* out of the disaster.

Doug ran an advertising agency that would push hemlock as a nutritional drink if there was enough money in it. As far as Karen was concerned, he was so morally bankrupt that eating a rat could only improve him. If he hadn't been Richard's brother she would have refused to let him in the house, but as it was she had to be pleasant to him at least once a month when he came over for dinner. Well, the rat soufflé was an accident, but she could at least enjoy the lucky timing.

She watched him scoop a lumpy spoonful of the stuff onto his plate and pass the bowl on to Richard. She nearly said something then, but Richard had been just as big a jerk lately as Doug, so she let him dig into the soufflé as well.

But Bobbie sounded the alarm before either of them could make the discovery on his own. "Oh, gross!" he shouted, pointing at his uncle Doug's plate. "Mom, you did it again! You cooked my rats again!" Richard looked up in astonishment as Bobbie jumped up from the table, knocking his chair over backwards, and fled, wailing like a tea kettle on a high flame, from the dining room.

Doug excavated around the rat with his fork, then set the fork down on the edge of the plate with hardly a click. "Am I to understand that this is a regular—entrée—in your household?" he asked.

"Second time," Richard said, and there was fire in his voice. "Second time this *week*. Karen, what's going on here?"

Karen slumped in her chair. The moment of vindication past, she now had to confront the question. Trouble was, she had no answer, neither for Richard nor for herself. She fought down the scream building in her own throat and whispered, "I don't know. For the love of God, I have no idea what made me do that."

Richard stood up. His chair tipped over, too. "Oh, come off it, Karen. You're telling me you cooked your son's pet rats in a soufflé *twice* now, and you don't know *why?* I find that a little hard to believe."

Karen could think of lots of possible reasons for it, starting with because she hated rats, and because she knew Bobbie only got them to keep her from going into his room and cleaning it while he was in school. But neither of those were *the* reason.

Doug cleared his throat. "Now, now, Dickie, don't be too hard on her. I'm sure there's a perfectly good explanation for it." Looking at Karen with all the compassion of a snake about to strike, he asked, "Have you been feeling stressed lately? Overworked? Maybe you should lighten up on the housework for a few—"

"Bugger off, Doug," she said, sitting straight again. If anything could be worse than ruining her family's dinner, then having Doug false-emote all over her right afterward was it. She knew a lecture when she heard one coming, and Doug had been about to dive into his

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"you're too obsessive" routine again. Just because she'd married his brother didn't give him a right to criticize her behavior.

She took a deep breath, then, trying to remember, said, "Look, I don't know what happened. I followed the recipe. The same recipe as before, because I was determined to get it right this time. I was being *careful,* too. But . . . things got a little fuzzy when I came to the part about folding in the eggs. I guess I went into some kind of trance or something. And I went into Bobbie's room and got the rats and . . . and just . . . put them into the batter."

"I'd think they'd have crawled out," Doug said. Richard snorted, but whether that was a laugh or a sound of disgust, Karen didn't know.

"I hit their heads against the countertop," she said.

"You hit their heads against—" Richard began, but Doug cut him off.

"May I see the recipe?" he asked.

"What?"

"I'd like to see the recipe, if I could." He got up, carefully scooting his chair back, and righted Bobbie's chair on his way around the table.

Karen got up and followed him into the kitchen. "Here," she said, pointing to the magazine next to the rack of already washed dishes. Karen always did the dishes while she cooked, so only the final bowl would be dirty.

The magazine was still opened to the right page, the rest of it curled under to hold the place. Doug only glanced at the recipe, then picked up the magazine and uncurled it. Ever the advertising executive, he examined the ad on the facing page carefully, even bringing it to his nose for a moment to sniff at it before laying it back on the counter. "Looks normal enough," he said, but Karen thought she heard a hint of something else in his voice. Was that one of his competitor's ads? she wondered.

She looked at it more closely herself. It was one of those understated ones, a picture of an old barn in autumn, with yellow and red leaves on the ground and no obvious product in sight. A patch of bubbly ink among the leaves held a fragrance that was supposed to be released when you scratched it, but that hadn't helped Karen figure out the ad, either. She supposed people like Doug knew exactly what it was selling, and probably how much the product cost, and how much the ad increased sales, too, but she certainly didn't. She considered telling him that those kind of ads went right over most people, but she didn't feel like getting into an argument with him about it. Things were bad enough.

Richard had followed them into the kitchen. So far he'd been quiet, but that only meant he was preparing to make one of his many pronouncements. Only this time it wouldn't be "Do your goddamn vacuuming while I'm at work," or "Leave the windows dirty for just one day, would you?" or "Don't go through my drawers and fold all my underwear." No, this was going to be a Pronouncement. Words from On High.

Karen waited, knowing what it would be.

He didn't disappoint her. "First thing in the morning," Richard said, "I want you to go see a psychiatrist."

The psychiatrist's office was on the

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second floor of an innocuous-looking office building. The name on the door just said Charles D. Carter, MD PC. There were no flashing neon signs saying "Crazy people enter here!" nor any reporters waiting to take her picture as she opened the door. That was a relief.

The waiting room was a cube with three couches in it. A second door led on into the office, but it was locked. A small hand-written sign on the door said, "Have a seat and the doctor will be with you shortly," so Karen sat down on one of the couches and picked up a magazine off the end table.

She found an article about Arnold Schwarzenegger and began to leaf through it, but an ad for cologne caught her eye and she stopped, intrigued. Something about that ad was certainly compelling. Not the photo; it simply showed a square bottle with a not-particularly-beautiful label bearing the single word: "Possession." There was a patch of bubbly ink on the lid that no doubt held a sample of the stuff. Karen scratched it tentatively with a fingernail. Sometimes those scratch-and-sniff ads could be pretty horrid. This one wasn't bad, though. Kind of an odd undertone to the aroma, but not unpleasant. And it did make Karen think of men.

She scratched it again and inhaled. Yes. Big, muscular men in tight jockey shorts with their bodies oiled and glistening. Mmmm. She scratched at the bubbly ink again.

"Mrs. Wilson?"

She looked up. A dark-haired man in a brown sweater and brown corduroy pants had opened the door and leaned part way into the waiting room. "I'm Dr. Carter," he said. "Would you like to come in now?"

She sized him up. He was no Schwarzenegger, but he did have muscles beneath his sweater, and his pants fit tight enough to show a slim waist. He would do. "Sure," Karen purred, leaning forward as she uncoiled from the couch.

She followed him down a short hallway to another small room, this one with just one couch and a big padded chair next to it. "Have a seat," Dr. Carter said as he turned to close the door behind her.

"I'd rather have you," Karen said, slipping her arms around his waist and pressing her breasts against his back.

The psychiatrist tried to turn around, but Karen held him tightly, holding her face against his back and rubbing her hands over his chest. "Mmmm," she murmured. "I should've come to you a long time ago."

"Mrs. Wilson," Dr. Carter said toward the door, "I was under the impression that you wanted to talk about a more . . . innocent type of compulsive behavior. Perhaps I should refer you to a qualified sex therapist."

"Perhaps you should take off your clothes and join me on the couch," Karen said, pulling him that direction. Somewhere in the back of her mind, a tiny voice was shouting "This isn't normal!" but she hardly noticed. She was too busy to notice.

But Dr. Carter finally managed to grasp her hands, and after a brief struggle he disentangled himself and held her at arms length. "Stop that," he said, and the tone of command in his voice made her stand still.

He studied her for a moment, and she wondered if he would suddenly bend

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forward and kiss her, but instead he merely let go of one hand and said, "Touch yourself on the top of the head."

As if hypnotized, Karen found herself doing so.

"Aha," he said. Just "Aha." Then, letting go her other hand, he opened the door again, disappeared for a moment, and returned with a plastic cup of water and a small white pill. "Swallow this, please."

Without hesitation, Karen did.

"Now, sit down."

Karen sat on one end of the couch. She knew the drug must be working because she was already beginning to feel profound embarrassment at what she'd just done. "D-Doctor," she stammered, her breath ragged, "I'm sorry. I don't know what got into me. I—I don't normally do things like that."

Dr. Carter sat in the chair and crossed his legs above the knee. He was still breathing a little hard himself. "I didn't think you did," he said. "I must say, though, yours is the most dramatic case of compulsive behavior I've ever witnessed. And the most dramatic release from it, as well."

"Yeah." Karen straightened her blouse. "So what was in that pill?"

"An antidote to a chemical your brain produces. It's brand new—the antidote, that is. We've just begun to understand the nature of compulsive behavior, actually, but fortunately for you, we understand enough of it to help cases like yours." Dr. Carter held his hands in front of him as if holding onto a grapefruit. "You see, your brain produces chemicals, called endorphins, to help manipulate thoughts. Sometimes it produces too much of certain ones, and your mind starts to behave abnormally because of it." He tilted the imaginary grapefruit to the side. "Different chemicals cause different behaviors, ranging anywhere from excessive hand-washing to serial murder, but in your case you evidently become extremely open to suggestion, and like other sufferers of the same condition, you can't stop acting on whatever you've fixed upon until those endorphins dissipate. Usually completing the act in question will cause the brain to neutralize the endorphins responsible, but this time we were able to neutralize them artificially before that became . . . ah . . . necessary." He blushed.

Karen was too fascinated to blush. "You're saying I think the way I do because of different chemicals in my brain? I mean, I knew that, but are they really that specific? One chemical makes me compulsive, and if you get rid of it I'm normal?"

Dr. Carter nodded. "That seems to be the case. As I said, this is a very new field of study, and we don't understand all the implications yet, but we know enough to help in certain clear-cut cases like yours."

"So yesterday when I put rats in the soufflé, it was really just these chemicals making me overreact to something that suggested rats to me. Like my brother-in-law Doug."

"Rats?" the doctor asked, but Karen didn't bother to explain.

"That's not important," she said. "What's important is that antidote stuff. Can you give me a prescription for it?"

"Yes, of course." The doctor

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reached into a pocket in the side of his chair and produced a prescription pad. "I must warn you, though, that this isn't something you can take continually. Your brain will react to steady levels of this, and simply learn to produce more of the endorphin responsible for your compulsions. So you should use it only when you notice the condition coming on."

"If it's like what happened a few minutes ago, then I won't know it's coming on until after I've done something bizarre," Karen pointed out.

Dr. Carter nodded. "That's true. You'll have to rely on the rest of your family to warn you when you're acting strangely. Let them be your judge."

Oh, great, Karen thought. Richard will love that. I'll never be able to clean the house again, if he gets wind of this. She took the prescription from Dr. Carter, folded it once, and put it in her purse. She'd buy the medicine, but she'd be damned if she'd let Richard know about it. She'd just have to get along as best she could on her own.

There was a line at the prescription window. Karen eyed the display of men's shaving paraphernalia on the shelves next to her as she inched her way forward, but her mind was a million miles away. Chemicals in her brain, eh? What a shock to realize that a person's behavior could be so tightly controlled. A few molecules too many of this and they became axe-murderers, a few too many of that and they put rats in their dinner or became a nymphomaniac. She wondered what molecules made her brother-in-law become an ad executive.

Maybe she should give him one of her pills and see if he turned into a human being again.

"Ma'am?"

The line had cleared while she was daydreaming. She handed the prescription form to the druggist and waited for him to fill it.

"Want to pay for that here?" he asked.

"Sure."

"How about that cologne?"

"Beg your pardon?"

He pointed. "That cologne you're holding. I could ring it up for you here so you don't have to stand in line again at the main registers."

Karen looked down at the box in her hand. It was a bottle of the "Possession" cologne she'd seen in the ad at the psychiatrist's office. She hadn't even been aware of picking it up.

It would be too embarrassing to put it back now. Besides, she could give it to Richard as a peace offering. "Sure," she said, and she set it up on the counter.

That night, lying awake in bed, she thought about her behavior in the psychiatrist's office. What had set her off like that? It wasn't the cologne in the ad; Richard had splashed some of it on his face when she gave it to him and it hadn't done a thing for her.

It hadn't smelled the same, though. There was something missing from the bottle that had been in the ad. That *compelling* aroma was missing.

Compelling aroma? Good God. She'd been reading about Arnold the Hunk when she got a nose-hit of that stuff, and the next thing she knew, she

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was attacking a stranger. She didn't have a name for it, but suddenly she knew what that odd smell was.

And the ad next to the soufflé recipe? Could that be why she'd been so obsessed with doing it a second time, and why she'd cooked her son's pets into it both times?

Silently, so she wouldn't wake Richard, she slipped out of bed and padded into the kitchen. The magazine was still there. Karen flipped it open to the recipe and the ad beside it, scratched at the ink over the leaves in the ad, and inhaled. Whoa. Those were some *very* interesting leaves. Compelling, even. If she'd known what the damned scene was supposed to be advertising, she'd probably be out the door on the way to buy it, but she still had no clue. It was just a picture of an old barn. Her grandfather had had a barn like that, but he never let her play in it because it was full of—

—Because it was full of rats!

So. The barn reminded her of rats, and the bubbly ink carried not only the aroma of leaves, but the chemical that caused compulsive behavior.

And Karen bet she knew just how that chemical had gotten there.

"Mr. Walker is in a meeting," the receptionist told her automatically, but Karen didn't even slow down. She passed the desk in three strides, threw open the massive wooden door as if it were a curtain, and strode into Doug's office. He was alone, playing a video game on his computer.

"Uh, hi, Karen," he said.

"Hi yourself, you slimy bastard. I'm onto you."

The receptionist stepped into the office. "Mr. Walker, should I—?"

He shook his head. "That's OK, Janice. This is my sister-in-law. Give us a minute, could you?" When the door closed behind her, he asked, "You're onto me how, Karen?"

"Your ads. You're trying to make people buy your products."

He shrugged. "That's the point of advertising."

"Not when you fiddle with their brain chemistry it isn't!" Karen waved the magazine with the recipe in it at him. "It isn't working anyway. I didn't buy your stupid barn; it just made me kill my son's pet rats. Twice!"

"Jeans," Doug said. "It's an ad for jeans. Part of a series of them. And highly successful, I might add. No pun intended."

"Very funny. Of course it's successful. You've found the brain chemical that triggers compulsive behavior. Put it in an ad, and it triggers compulsive buying. But that's not all it triggers."

Doug shook his head. "Come on, Karen. Brain chemicals in ads? Don't be silly."

Karen opened the magazine to a dog-eared page. From her purse she withdrew a butcher knife. "I figured you'd deny it. Well guess what I've been doing all night? I've been reading murder mysteries. Slasher novels. Just the gory parts, too, where people get hacked to bits. I've got bloody torture running all through my mind, and only my normal inhibitions from doing that sort of thing are keeping me from acting it out on you. So what do you say, should I sniff this ad?" She brought the magazine up close to her face.

Doug turned white. Karen had been

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reading about such reactions all night, but this was the first time she'd ever seen someone actually do it. "N-n-no," he whispered. "Don't do that. P-p-put the magazine down. I'll pay you whatever you want. I'll stop running the ads. Just put the magazine down."

Karen laughed, and scratched the ad.

"Aaaahh!" Doug screamed, kicking off from his desk and rolling across the office to crash into the opposite wall.

"False alarm," Karen said, dropping the knife back in her purse. "I've got an antidote to the stuff, just like you do, so I'll let the Federal Trade Commission or whoever's responsible take care of your stupid ads. And sure, I'll take money to keep quiet. But that's not all I want."

Doug looked almost naked, sitting on his chair without his desk around him. "What *do* you want?" he asked.

Karen screwed the lid down tight on the perfume atomizer. The stuff inside was practically odorless, but that was fine with her. Odor would only alert her prey. She sprayed a fine mist, sniffed, and smiled at the tingling anticipation she felt. Oh yes, this was the pure stuff. If she hadn't taken half a dozen of the antidote pills, lord knows what she'd be doing now.

She turned toward the living room. "Bobbie," she called. "Bobbie, come here a minute, honey."

Her son stuck his head out of his room. "What?"

Karen walked over to him, squeezed the bulb, and wafted the mist toward him. "Smell," she said.

He took a cautious sniff. "I don't smell nothin'."

She waited a moment, watching his nostrils flare out and his eyes grow wide with interest.

"Clean your room," she said.

Without a word of protest, Bobbie turned to obey.

Karen watched him work for a second, then went on down the hallway toward Richard's study. It was time he learned to help her wash the windows. ■

●UNFAIR COMPETITION: Any competition with a perceived chance of cutting into my market share.

from *Kelvin Throop's Lexicon of Popular Parlance*

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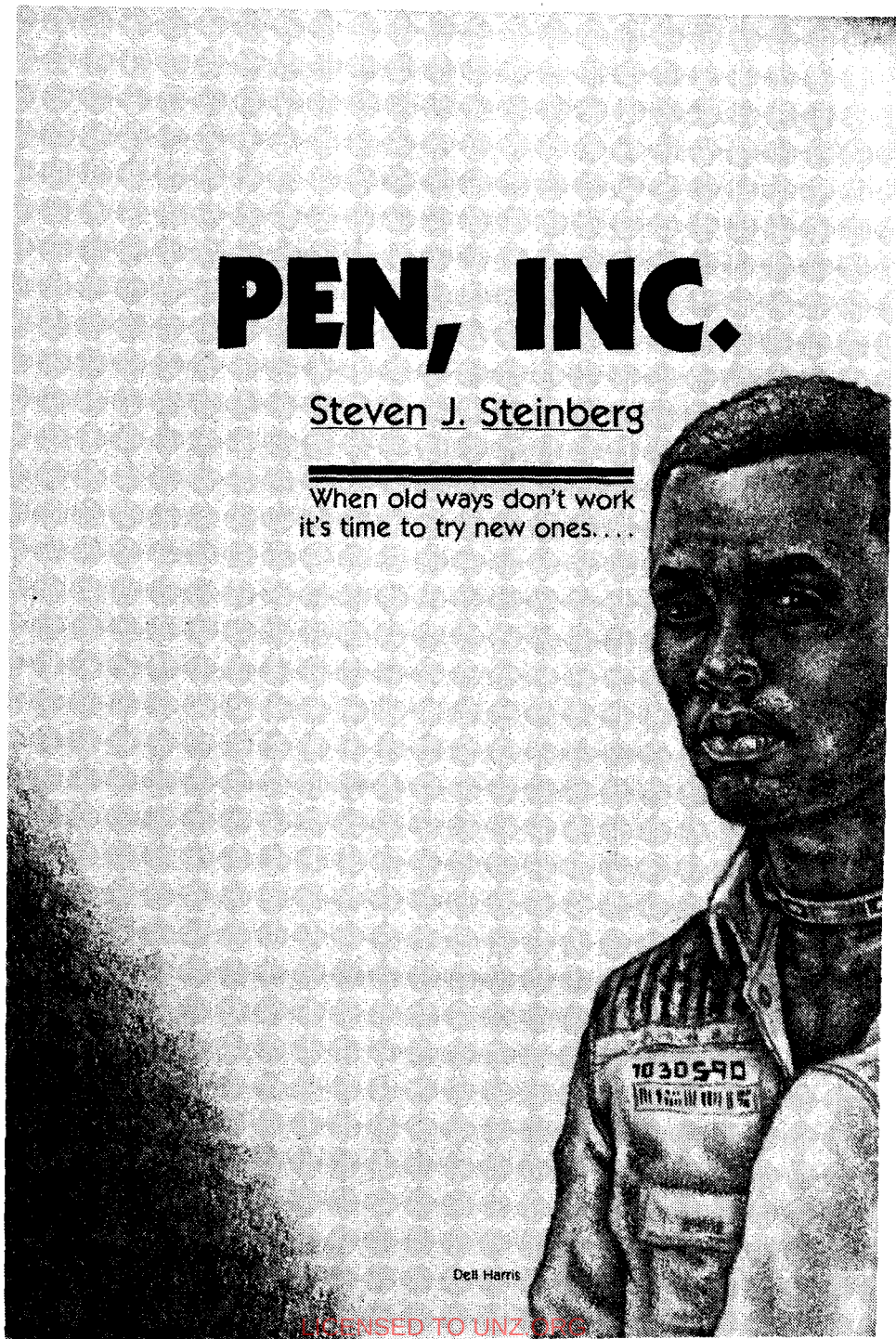
PEN, INC.

Steven J. Steinberg

When old ways don't work
it's time to try new ones. . . .



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Leonard Murchison worked the waldoes the way a concert pianist performs an etude by Chopin. With style. Grace. And a level of proficiency that dazzles the audience, which in this case, was his immediate supervisor, Kent O'Mara.

Sweat formed in little beads along Murchison's wide upper lip, despite the near chill in the air-conditioned room. Every few seconds a tic would convulse his left eye, ever so slightly. One slip, one twitch, and three days of grueling labor would be wasted.

O'Mara, too, was wired, his fifth cup of black coffee that afternoon cooling on the workstand adjacent to the waldo assembly. He watched as, on the other side of thick double-paned lead glass, Murchison's efforts paid off. They were still on schedule, but just last week, during a similar moment, the hard drive containing the artificial hand's intricate feedback program had crashed and a day's labor went down the tubes with a dropped canister.

Cleaning up a radioactive spill like this one was time-consuming, repetitive work. At the moment, Murchison was using the waldoes in concert with a scrubber. The scut work was the easy part; he was now at the stage where he had to squeegee up the fluid, vac it into lead-lined stainless steel containers, and cap them tightly.

It was the capping process that demanded all his concentration. Although the feedback through the "female" gloves that enclosed his hands was absolute state-of-the-art, sealing the containment capsules required a good deal of pressure; too little and you didn't get a positive seal—too *much* and the lid could go flying off, knocking over the vessel.

"Come on, baby, just . . . a little . . . more. Gotcha!" Murchison exhaled explosively as he felt the reassuring *click* of success.

O'Mara, behind Murchison, rolled his eyes upward in relief and started to slap the waldo operator on the back, then checked himself in motion. The book was *real* specific on supervisors' actions in that regard.

"Nice, Lenny, nice," he said, instead. "That was some piece of work, kid."

Murchison used the toe of his shoe to toggle the release pedal and the two waldo hands clam-shelled open. He made two fists, knuckles cracking, then flexed his fingers.

"Know what I could use right now?" he asked O'Mara, in what was becoming a ritual after each successful run.

"A shot of Cuervo Gold with a Tecate chaser in a chilled mug, with lime," the other replied flatly, watching Murchison unconsciously reach up to run a finger beneath the thin black band of ferro-plas around his neck.

The torque.

"Hey, that's *my* line," Murchison grumbled. "Goddamn, you'd spoil a wet dream, you know that?"

O'Mara, his two white caterpillar eyebrows descending over crinkling, deep-set blue eyes, had a smile in his voice when he said, "I know, Lenny, I know. C'mon, let's go."

O'Mara flicked a small switch on the transceiver attached to the collar of his blue uniform, softly vocalizing: "O'Mara, ready for escort."

A guard, armed with a squat, ugly

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torque control box took Murchison in tow for the forty-five minute drive back home from ProTek Industry's now-compromised-but-soon-to-be-reopened radioactive-waste disposal facility.

Home. To Cell-block Delta.

Anthony Villers's office was decorated in the currently fashionable neo-art-deco style. Curves abounded, from the neon sculpture on the wall behind his desk to the chrome and obsidian lamps in each of the four corners.

He had two cathedral windows, one real, overlooking the Georgia piney woods, resplendent at this time of year with snowy dogwood and pink azalea. The other was a repeating sixty-minute, high-def holo loop of his home town; depicting a haunting Chrysler Building, shot during the magic hour when natural and artificial light values danced in and out of balance just before, during, and after dusk.

Villers loved this sanctum of his. From the buttery leather chair behind his oval cherrywood desk to the teak bookshelves inset along two abutting walls.

It was no more grandiose than any of a half-dozen top executive suites he had occupied during the latter portion of his two decade long career. But, at forty-five, for the first time since his dissertation at Wharton, he felt plugged into something vital and inspiring.

Villers groomed himself with particular pride each morning in order to parallel the values he'd put into place in this twenty foot by thirty foot room. He kept his black hair long enough to be slicked back, displaying the widow's peak he'd inherited from his grandfather. Still short enough, though, so that it did not touch his collar in back, and he did nothing to inhibit the ever-spreading silver patches at either temple.

He owned fifteen Saville Row suits, most of them double-breasted in dark blue or charcoal, to offset the icy violet eyes that most people noticed immediately. His clothes were cut in the latest wasp-waisted French fashion, with high-side vents, both to accentuate his spiderish six-foot-three frame and impress the casual observer with his appreciation for the *au courant*.

That was partly how, by Villers's reckoning, you *got* to the upper stratospheric demesne of the corporate universe.

The sum total effect dazzled most visitors. The office and its inhabitant bespoke power and a dynamic sense of self.

Villers was looking over a proposal for a swampland reclamation project for an area called Sweetwater, just to the north and west of Atlanta. After the '96 Olympics, when the world had gotten a taste of the city which, for years, its residents earnestly believed offered the finest potential cosmopolitan lifestyle of any metro in America, the *real* boom began.

Suddenly, in the first years of the new millennium, Atlanta was *in*. Thanks to a major post-'70s influx of New Yorkers, Chicagoans, St. Louisians and, perhaps most surprisingly, expatriated Angelinos and Friscoids, by the time Atlanta hit its stride in the last days of the '90s, it didn't have to apply a *veneer* of sophistication . . . it was the real thing.

And a city, which had once considered anything outside its oval Interstate

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Perimeter—I-285—as the booniest of the boondocks, was now treating exurban real estate with the same chop-licking respect usually accorded a Rembrandt or Monet.

The Sweetwater Proposal involved both ends of the manpower spectrum, everything from men in hip boots mucking about with rakes to post-doc biologists identifying and removing from harm's way any endangered flora and fauna.

Plus engineers in all flavors, from civil to solid state electronics. And surveyors, heavy duty construction workers, carpenters, electricians, drivers, et al.

Villers's resource-roster of people on hand fulfilled all the job descriptors with a comfortable level of redundancy. Best of all, logistics on site would be a no-brainer, with Atlanta just twenty miles away, a short run down The Thornton Connector to I-20.

As far as the competition was concerned, that, too, was a lock.

There *was* none.

No other company in the region—or for that matter, in the country—wanted any part of it; simply put, the payoff involved far and away fell shy of the payout *traditional* companies had to contend with.

Villers's mouth turned up ever so slightly in appreciation of the scope of the project; the way in which the public would regard its completion; and, most importantly, the cachet of success that would accrue to Pen, Inc. and he, Villers, personally.

He was punching numbers from the proposal into his laptop mainframe when his intercom chimed softly.

"Yes," he replied in that modulated tone so many highly-placed executives cultivated.

"Mr. Villers," announced his secretary, "your 4:45 appointment, a Ms. Chasrekkar, is here. Shall I bring refreshments?"

"Send her in, Pamela. And yes, thank you, coffee service will be fine, unless Ms. Chasrekkar prefers tea."

Villers stood *before* the door to his office opened. In walked a striking woman in her late thirties, with cafe au lait skin, blue-black hair that fell in a soft nimbus, framing a high cheekboned face and piercing, yet warm, mahogany eyes.

"Mr. Villers, I'm Adele Chasrekkar," she said, somewhat formally, extending a small, dry hand. Her fingernails were unpolished, but long. Villers made a fast mental note that she wore carefully applied lipstick and eye makeup, but in subdued shades that complemented her complexion.

"Ms. Chasrekkar, a pleasure," he returned, leading her to the low, glove-leather couch and matching ottoman near the real window, "I've been looking forward to our chat." He sat on the smaller of the two sofas and gestured for his guest to place her slim eelskin attaché case on the black lacquered coffee table before them.

Cutting to the quick, she said, somewhat brashly, "The pleasure's all *mine*, Mr. Villers, although I don't think *chat* is the operative word for the dialogue I came prepared to have with you this afternoon." She smiled archly. Villers suspected this was all part of the Adele Chasrekkar go-for-the-jugular-opening-gambit school of thought.

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"Really? Dialogue? From the tone of our phone conversation last week, I understood that you were coming on this fact-finding tour with a list of preconceived notions. I'm *delighted* that you came here with two-way communication in mind."

"Preconceived?" she shot back. "I know our conversation last week was a bit strained, but I never meant to—"

Villers smiled, leaned forward, tilting his head. "Oh, please, Ms. Chasrekkar, there's no need to mask our positions, I'm perfectly content knowing you came here on a blood scent. Senator Lackland makes his idol, Bill Proxmire, look like a dilettante when it comes to pointing fingers at federal boondoggles. So when he sends his chief of staff a-running in *my* direction, I know which way the weathervane's pointing."

"Then it's important you understand that Josh Lackland didn't send me here to bring your head back on a silver platter."

"Of course not. As I recall, he's the whip of the political party which wouldn't approve of anything so ostentatious as a *silver* platter. Pewter, maybe."

As he'd hoped, the icebreaker worked and she smiled, displaying a bright set of teeth. "Brass, if it's to match your forthrightness," she admitted.

"Look, I know where Lackland stands, and I wouldn't have consented to see you on such short notice if I didn't think I had a chance of at least opening your—*his*—mind to the possibility that what we're doing here is valid."

Now she leaned toward him. "Valid? Mr. Villers, and I'm only speaking for myself here, validity applies to statistics. What we're dealing with here are people. Flesh and blood people who are guaranteed certain *inalienable* rights by the very Constitution Josh Lackland —and you, yourself—are sworn to uphold."

"Ms. Chasrekkar," Villers said somewhat testily, "I think what we're doing here does nothing to abrogate anyone's rights, not even a constituency that, as in this case, might be considered by some to *deserve* a little abrogation by its very deeds. Boy, that was a mouthful, huh?"

Her eyes gaped wide. "Are you suggesting that the Constitution of the United States shouldn't apply to all its citizens?"

Villers went in for the kill, much sooner than he dared anticipate. "Not in the least. Ms. Chasrekkar, citizenship and its rights are *privileges*. That's why felons, for example, lose some of those privileges as part of the debt they owe society for their miscreancy. Like the right to vote. To buy handguns. Shall I go on?"

She stopped him. "No one, no matter how heinous the crime, may be subjected to cruel or unusual punishment, Mr. Villers, regardless of his or her citizenship privilege status."

"You'll get no argument from me on that point, Ms. Chasrekkar, as long as you're willing to accept the fact that *any* citizen may be deprived of life, liberty and/or the pursuit of happiness as long as that deprivation is in accordance with due process of law. That's what the Constitution makes so abundantly clear. Due process."

"So it all boils down to what consti-

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tutes due process, then?" she quickly responded.

"In *due* time, once we take the grand tour," he continued, "I have every confidence that that's one axiom upon which we'll both agree. *Every* confidence, Ms. Chasrekkar. Ah, here's Pamela with the coffee. It's my own special blend of Jamaica Blue Mountain and Dark Kona, I hope you'll try it. Then I'll take you on the fifty-cent tour, all right?"

Adele Chasrekkar accepted the fine bone china cup and saucer, and after Villers had served her himself, took a tentative, slow sip.

He wasn't absolutely sure, but by the slight widening of her eyes, he surmised it might, just might, be the best damned coffee she'd ever tasted. And *that* he found very tasty.

Veonzell Dupree looked up as Murchison entered their shared cell, an expression of bored detachment etched plainly on his face. "How you doin', m'man?" he asked in that distinctive, slurry, don't-give-a-rat's-ass accent that could only have come out of The French Quarter or an adjoining district.

"Tired, man," replied Murchison, back-flopping into his lower bunk. "So, how many credits you think you scored today on the line?"

Veonzell ran bony fingers through the puff of his neo-afro. "Dunno. Din't burn up no records, though." When he said it, it sounded like *boyne*.

"Vee, man, you gotta—"

Dupree's yellowish complexion turned darker as he interrupted harshly, "Doan give me none a your 'gotta-do-blues,' man. I doan need that shit after a day like I put in today, you catch what I'm throwin'?

Murchison knew better than to follow that up with anything other than banal patter. "Gotcha. You going tonight?" He grimaced as soon as the words left his mouth; this was another potentially touchy subject. Although both men were taken to mess during the same shift, they did not eat in the same section. Veonzell shrugged.

Murchison carried a Felon, 1st Class card. He went to Mess Area "A," where there were chairs, not benches, at each table. Where the food was eaten on plastic plates, after being carried from the serving line on trays, but not on the trays themselves. The silverware was still counted in and out at each meal, but it *was* metal, not flimsy disposable styrene that wouldn't cut pasta. Felon-Firsts drank real milk, not powdered, could go back for seconds, and could count on the quality of the food to be cafeterialike, even if the preparation was on the institutional side.

Veonzell held only an F-3rd. This was partially due to his record: 2nd-degree murder in an armed robbery. Partially because he got in fights with other inmates. And mostly because he couldn't advance his psych profile into the green.

There was nothing unusual in having a First and a Red-Lined Third as cell mates. A First was still, after all, a convicted felon and as such had to cope with the punishment aspect of incarceration. Often, part of that punishment was being forced to share living space with what might be construed as a less-than-desirable cell mate.

Conversely, having Thirds in con-

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stant contact with Firsts served as a continual reminder to the Thirds that with appropriate behavior came rewards. Work hard. Make restitution. Compensate. Don't fight. Seek opportunity. Excel. Train. Learn. That's how a First got to *be* a First.

A First could be demoted, much more quickly than the ascent mode. Again, *behavior* was the key. Fight. Slack off. Screw up. Cop an attitude. Veg out. Give up. Down you go.

Murchison had been a First for the last few years of his sentence. His first years had been a series of up and down swings, from Third to Second to Third to Second to First to Second, and finally back to First.

He'd played the game, which, ironically, was exactly how both he and Dupree would account for his succcess. Murchison expressed it with a certain sense of pride and accomplishment. But "going along to get along," to Dupree's way of thinking, meant being manipulated like a puppet.

"It's a pride thang," he'd told Murchison often enough. That's why he sometimes elected not to go to the mess hall for his hot meal of the day— Thirds only got one—and that one was often beans & soy-franks, two slices of dry white bread, reconstituted milk and dried fruit. Instead, he'd opt to rehydrate a ration pack right there in the cell and scarf down the 500-calorie brick of flavored carbohydrate/protein bar which constituted at least two-thirds of each Third's meals.

Murchison hadn't eaten one of those in so long, he could almost forget, *almost,* how insipidly not-bad/not-good they were.

"*Think,* Vee, it might be chicken a la king tonight," teased Murchison, good-naturedly, in a sing-song voice. "You play the averages, it's gotta come up again soon. Come on, even if it's not, you might get to see Big Moe try to dance on that newbie guard's face again, right?" Dupree gave in with a cracked grin.

"Yeh, you right. My stomach's been turnin' over all day, anyway." The way he said it, it came out *toynin*. Murchison often thought Veonzell purposely sought out words with u-r in them, just so he could strut that N'Awlin's stuff.

Murchison went over to the sink and pumped some depilatory from the dispenser. He lathered his face and neck, then wiped off the stubble-flecked froth with a disposable towel.

Veonzell's own beard was just under the maximum length allowed. In a few days, he, too, would have to "shave." And start his beard all over again. It was a cycle he'd repeated over and over since he and Murchison had been cell mates.

"Say, how come you do dat every single day?" Dupree asked, watching Murchison check the Lexan mirror over the sink for any missed spots.

"What, *this?*" he questioned in turn, rubbing his chin with the back of his hand. "Dunno. I suppose a *full* beard looks good, but with the quarter-inch they allow inside, I'd rather go clean cut."

"Dere you go again, man, you cain't say but two words and one of 'em's gonna be 'bout how you always lookin' to be such a stand-up dude an' all."

"Vee, whaddya want me to say, huh? You question me all the time and when

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I tell you my reasons for doing things the way *I* see 'em, you jump in my stuff about what an ass-kissing fool I am to play into The Man's hands.''

''Hey, you said it, man, not me,'' Veonzell debated, looking at his broken nails.

''Vee, what can I tell you? *I'm* walking around with a First Class Ticket in my pocket, I'm 95 percent of the way through Restitution and when I get out, I've got a trade.''

''Heh, you got it knocked all right, man. You servin' what, fourteen-long for that armed job you pulled in Seattle? Be outa here in what, five mo'? Four? An' you'll be a gen-you-ine nuke janitor! Dat's some great prospects you got f'yourself, wipen' up dat nasty new-cue-lar waste shit. Damn, coulda had *me* a career with real poe-ten-shull, but noooo.'' Pause. ''You a fool's fool, you know that, Murch?''

''OK, you're absolutely right, as always, Vee. You win. Happy? Good. Come on, get your lazy black ass offa that bunk, the chow bell's gonna ring any second.''

''Hey, who you callin' a black-ass, man?''

''You, you mo-fugly mutha!'' retorted Murchison, striking a mock boxer's stance, pumping his fists.

''Yeah, man, well, you're still ten shades blacker'n me when you standing in the noonday sun, but I never met *no*body whiter'n you, comes to some things.''

Murchison caught his image in the mirror. It was true. His skin was almost blue-black compared to Dupree's light yellow.

''My God, you're right! About that new-cue-lar waste stuff. Gee, back when I started, I was white as Uncle Ben's and *now* look at me.''

Veonzell chuckled, then the chow bell rang. Their barred door slid open, along with all the others in D-Block. As they left together, Murchison put on his best Veonzell voice and said, ''You know, if it *is* chicken a la king in your mess hall tonight, sho' hope dat they don't *boyne* it.'' Veonzell laughed even harder.

Adele Chasrekkar felt vaguely uncomfortable in the borrowed one-piece coverall and hard hat Villers had provided for her to wear during the tour; first, they'd walked through the pre-fab assembly line, and, now, the catwalk above Cell Block Delta. If the costume was meant to put her slightly out of phase—and she was fairly certain that was the intent—it was working.

Walking alongside her, Villers wore his custom-tailored jumpsuit like it was a second skin. Every so often he would cock his head, distracted. He'd explained to her about the subcutaneous mastoid transceiver that kept him in constant contact with the Central Net, and how he could talk back, just under his breath in private two-way conversation.

''Looks like a lot of other jails I've been to,'' she commented, once his attention returned to her, in order to let him know that this wasn't new territory for her.

''Really? This is a penitentiary, not a jail. There *is* a difference,'' he tossed off, and she noticed the smug smile flit across his face.

She stopped and turned to face him.

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With a finger poking in his chest, she explained, "Listen, Villers, if we're going to be adversaries each step of the way, I'll watch every thought that pops into my head. I *know* the difference between the local hoosegow and the place where felons are put to serve sentences. Now *you* know I know, so let's drop the fencing match, OK? Dialogue, remember?"

"Touché. What makes Pen, Incorporated so physically different begins over where we were before, though. And then winds up with what you see here." He waved his arm, indicating the broad expanse of the cell block. "Prefab stackable cells. Manufactured on-site, through high-tech assembly line production and labor provided by some of our, er, guests. All carbon-composite construction, from the floor to commode to the bars. No rust, no corrosion, no sanitation problems. We can even key-access a recessed water-outlet to hose each one out from the inside, if need be."

"Isn't that expensive? I mean, Pen, Inc. is supposed to earn a profit, no? All in the name of Economic, Socio-Capitalistic And Pragmatic Entrepreneurism."

"Well, I'm flattered that you're familiar with my White Paper."

"With an acronym like ESCAPE, how could I pass on it? And how could Harvard resist in awarding you that honorary Ph.D.?"

"I keep it on the wall at home. Doesn't mix with the decor of my office."

She wasn't about to let his ingenuousness dominate the conversation.

"Tell me the truth? Off the record. You really believe Pen, Inc. can pull it off?" she asked, leaning against the railing and hoping Villers didn't think she looked as waiflike as she felt in the oversized suit.

"The truth? 'Off-the-record' is something we don't know each other well enough yet for me to accord you. But *on* the record, as CEO—or warden, if you prefer—I stand four-square behind Pen, Inc. In fact, I'll go further than that. It's my conviction, no pun intended, that the private sector is the only way to go when it comes to dealing with the penal system in this country."

"So you think it's moral for private enterprise to profit from criminals brought to justice in America?" She set the line of her jaw firmly as she asked this.

"Under these auspices, damn right I do! Just as it's *im*moral for government to continue treating the penal system as if it's controllable using a methodology that, to date, has done nothing but exacerbate the problem."

They continued their leisurely stroll along the catwalk.

"Ms. Chasrekkar, if the gross national product of the United States had grown by even half the rate at which the criminal population has risen in the past fifty years, not only wouldn't we have a national debt, we wouldn't know how to spend the wealth."

"Propaganda, Mr. Villers."

"Hardly. Can I give you an example?"

"By all means." She leaned over the catwalk for a closer look at something that briefly caught her attention, then turned her face back to his.

"OK, let's take a typical felon, only

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not one from Georgia, where Pen, Inc. has entered the federal penal system on its pilot-program basis, but some other state. Like your home state. Massachusetts.''

''Commonwealth, not state. But go on.''

''A perpetrator cops a plea and looks at, say, seven years, with no chance of parole before then, when all is said and done. Which he serves in a crowded, filthy facility. Bad food. Performing meaningless labor for a few pennies a day. He hangs with scum, learns no trade other than how to be a *better* perp when he gets out, costs the state around seventy-five grand a year to incarcerate, is sexually abused . . . or abusive while in stir, and then gets out only to return within less than a year. Typical recidivism statistics, no?''

''I'll stipulate that, yes.'' She knew where this was going.

''And what about the people he's robbed? Or worse, assaulted. Or, worst of all, killed. Because that's what it usually boils down to with a felon, right? Where's their stake in seeing this wise guy locked up? Revenge? Justice? Those are two sides of the same coin that won't replace stolen property. Or the productive years of a lost loved one.''

''I thought a penitentiary was where the bad guys are supposed to go to act penitent, Mr. Villers. There's no penal sub-system I know of that requires restitution . . . except this one.''

Now she felt him poke her, gently, in her shoulder. ''What the hell is wrong with the notion of restitution? It lends a certain sense of dignity to the criminal justice system that's been sorely lacking, in my opinion. And it also reinforces the notion that we, as individual members of society, are responsible for our deeds and actions. How many perps in your beloved commonwealth might benefit from a perspective on life that demanded that *they*, and *not* society, be ultimately responsible for their actions?''

''We're straying. Where does the profit motive fit into this grandiloquent theory of yours? I still see something very smarmy in a corporation making money off all this.''

''Is there something 'smarmy' about a pharmaceutical company doing research for years, discovering a miracle cure wonder drug and then selling it to the public? Get real, Ms. Chasrekkar, it's the profit motive and not the good of the public weal that's often responsible for much of what's *right* with society.''

Again, she stopped in her tracks. ''Oh pul-leeze, spare me the corporate-apologist lecture. I'm old enough to remember when companies—defense contractors, for example—charged the people of this country $750 for a hammer, and four grand for a toilet seat cover. Profit motive, my ass.''

''OK, OK, but actually, you're helping me make my point. I agree with you. The executives who cooked those books deserved to face criminal prosecution. A lot of them did time, too, if you can call it that. Only if they were in my system serving sentence, they'd be forced to make restitution on those billions, and not just spend a year or two at some federal country club jail.''

''Don't be absurd. How long would it take someone to pay back a billion

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dollars?''

''More than a lifetime, I imagine. You don't get it yet, do you? In a society where mega-buck white collar crime nets the criminal what amounts to a slap on the wrist, what's the *dis*incentive, if you will, to deter the crime itself? How many of those sons of bitches who ripped off Uncle Sam would have done what they did, knowing full well that if caught they'd be responsible for making restitution? Even if it took, for all practical purposes, forever and a day.''

''I don't know,'' Adele admitted grudgingly. ''Look, Mr. Villers—''

''Anthony, please.'' They were at the end of the catwalk now.

''Thank you but no, I prefer keeping things off a social plane. Anyway, I've enjoyed our stroll and from this bird's eye vantage point, Pen, Inc. looks no better nor worse than a dozen other model penitentiaries I've been to. What say we get down to the dollars and cents?''

''Meaning?'' Villers asked, removing his hard hat to wipe a thin line of perspiration from his forehead.

''The money, Mr. Villers, the *money*. I've been over the P&L projections. Pen, Inc. is taking it up the whazoo.''

''True. We've been at it for two years and expect break-even in about three more, if we keep picking up projects. As you know, the company collects a per capita fee of $25,000 per annum on our prison population from the government, which is a hell of a lot less than is *spent* by either the state or the feds, per prisoner, in traditional institutions.''

''My point exactly,'' Adele jumped in, tasting the coppery spoor of blood. ''So how do you propose to let free enterprise save your corporate tush?''

Villers was growing weary of the conversation. It was one thing to preach to the choir, as he'd done years earlier when addressing the conservative congressmen who'd granted Pen, Inc. its charter and start-up funding. But Lackland's lackey—not that he felt in his gut that this striking woman was *anyone's* toady—was another matter entirely. Where to begin?

''Ms. Chasrekkar, twenty years ago it was a common sight to drive down any road in Georgia and see convicts in white coveralls, escorted by shotgun-toting guards, performing hard labor as part of their sentence.

''Pen, Inc. sees nothing wrong with that. It's work no one else, outside the prison population, wants to undertake at the wage-base such work provides. Today, my company's prisoners are mucking out swamps. Assembling prefab low income housing units. Cleaning up industrial and nuclear waste. Nasty work that needs doing, but no one else wants to tackle for the money involved. It's from that compensation, along with the per capita fees, we anticipate turning the corner, profit-wise.'' Villers could detect no chinks in her armor, yet.

He continued. ''So we treat our population of felons as a resource, not a burden, as does the traditional penal institution.''

''Save it, Mr. Villers. The only word that comes to mind is 'exploitation.' ''

''Is it exploitive when an army sergeant puts a trainee on K.P. and has the man or woman clean out the mess hall

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grease trap? Or a navy able-bodied-seaman has to swab a deck in near freezing weather and rolling seas? There's precedent here, Ms. Chasrekkar, for what you undoubtedly see as involuntary servitude, and we at Pen, Inc. view as making the most out of what you've got."

Villers saw a change come over his guest's countenance, but it wasn't his persuasiveness at the root, he was certain.

"OK, let's cut to the chase," she said hoarsely.

"How so?"

"Take me to death row. Second Chance fascinates me."

Murchison turned left, his cell mate turned right.

They're not serving chicken a la king tonight, I can smell the beanie-weanies from out here . . . poor Dupree, he thought, entering the F-1st Mess Area. *He looked really pissed.*

There was the usual subdued din of conversation filling the air as Murchison stood on line, sliding his tray on the plas-steel railings, picking up helpings of chicken stew, pole beans, roll, margarine, lettuce wedge, pudding and milk.

The prisoners were free to sit with whomever they wished, a First Ticket perk. Murchison lifted his tray, scooped up utensils and a small tub of french dressing, and scanned the hall.

He saw Joe DiBruzzi, sitting, as usual, off to himself at a far table.

Prisoners with AIDS were not segregated from the main population in the First Class mess. F-Ones were expected to display no animosity towards HIV patients in their number, upon penalty of reduction-in-grade. However, that didn't mean they had to be bosom buddies, either.

"Hey, Joe. What's the word?" Murchison asked jovially, sliding onto the seat beside his friend.

DiBruzzi was rail-thin, his sallow face pock-marked, not from the ravages of his condition but the aftermath of teenaged acne. He shaved his head bald, as did many of the prisoners at Pen, Inc. and this gave him a feral, lupine countenance. Which played contrapuntally with his soft, warm demeanor.

"Yo, Murchmeister. Do I detect a particularly radiant glow in your personality today, or have you been soaking up too many rads?" He shoveled a forkful of green beans around his smile.

"Nah, everything's same-o, same-o. You?"

DiBruzzi chewed thoughtfully, swallowed, and spoke. "The docs say the new phenoltrinepredine regimen's kickin' in like the front line of the '72 Dolphins. White count's up and the edema in my feet's goin' down. Not bad for sorry-ass sumbitch like me, huh?"

Murchison knew that DiBruzzi's self-deprecation masked a lot of baggage the convicted murderer carried around within himself. Sentenced to die in the electric chair in '98 for the brutal premeditated slaying of a crack-cocaine wholesaler, he'd spent eight years on The Row, in appeal after appeal, before time ran out. Then, he was allowed to volunteer into Second Chance at Pen, Inc.

He'd explained, or tried to at any rate, in a series of rambling conversations he'd had with Murchison over the

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past few months, that he'd come to accept the finality of his two sentences long ago. First there'd been his impending electrocution; then, after coming to Second Chance at Pen, Inc., the acceptance that the AIDS virus he'd been injected with would most likely, in the final analysis, be nothing more than a stay of execution.

So it wasn't a reprieve from death that had convinced him to trade in his date with Ol' Sparky, as the inmates called the electrocutioner's device, for the course he'd undertaken. It was a sense of purpose. That his death might have some meaning.

"Your appetite seems to be coming back," Murchison said cheerily, noting the big bite of dinner roll the other was stuffing into his mouth.

"Yeah, it's the THC pills they give me to keep the nausea down. Ain't that a boot in the balls, man? Not only do I get to enjoy my meals again, but I feel like I been toking on some bodacious weed. Life's one very weird ride, man."

"Amen to that."

"How you getting along with Mr. Negativity?"

"Dupree? He's OK, once you get used to his grousing. It's like he just can't get with the program, know what I mean?" Murchison broke his dinner roll into pieces, buttering each one separately as he spoke.

"Torqued out, huh?" asked DiBruzzi, fingering the ebony colored band around his neck. "Acceptance, that's the main thing you gotta get into, once you get Penned." He pushed his tray away. Murchison was gazing at the dish of banana pudding he hadn't touched. "Go on, I feel totally beached."

Murchison smiled and put the dessert on his own tray. "When I get out, I'm gonna make three packs of banana pudding at once, let it chill in a punch bowl, and eat the whole thing at one sitting."

"Yeah," grinned DiBruzzi, "that sounds real fine. You write me, tell me what it's like, huh?" DiBruzzi might —on a long shot—wind up cured, in the experimental research program, but he'd *never* be on the outside again. No parole for Second Chancers.

Murchison realized his *faux pas* had pricked his friend's sensibilities. "Sure, you bet, that's a real deal."

The bong chimed. Dinner was over. Time to lock down.

Villers and Adele sat in a subdued waiting room just outside the death row terminal ward, awaiting the arrival of Dr. Feldman, the hospital wing's chief resident. They were once again in their street clothes and Adele wondered what kind of material Villers's suit was made of, that it didn't wrinkle up the way hers did.

Feldman arrived, a portly man in his early thirties, dressed in the archetypal white jacket, stethoscope draped around his neck, LCD clipboard in hand. "Mr. Villers, nice to see you. I take it you're here to escort Ms. Chasrekkar to see Wiley McClendon?"

Villers's secretary, Pamela, had called ahead, proficient as always. Feldman introduced himself to Adele with a warm handshake and bade them to follow him down the corridor.

The trio entered what appeared to Adele to be a private ward of a public

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hospital. The walls were pea green and a single hospital bed, now surrounded by white curtains that ran on a track around it, was centered in the room.

A nurse, finishing some ministrations, pulled back the curtains and revealed a stick-thin man connected by an IV to a complicated machine off to the right. The man's eyes were half closed, but he turned to face his visitors.

"Hey, Doc," he said in a coarse but jovial whisper. "Got me some company? That you, Mr. Villers?"

"Hello, Wiley. I've brought along a guest who'd like to chat with you a bit, that is, if you're up to it."

Wiley McClendon attempted to reach for the button that would raise his hospital bed's back up, but was too weak. "Could you. . . ." Villers complied, and when Wiley was inclined he said hello to Adele.

"Mr. McClendon, my name is Adele Chasrekkar and I work for the senior senator from Massachusetts, Joshua Lackland, who heads up the Senate Subcommittee on Penal Reform. I know you're . . . under the weather, so I'll keep this short, all right?"

"Sure. Nice to have visitors." He coughed and the pain that ensued was written on his face. Adele looked at Villers, who merely gestured that she continue. But his facial expression said to her: *Hey, you asked to be here.*

"Mr. Villers showed me your jacket earlier today. You were sentenced to be executed in Texas by lethal injection and two days before that sentence was carried out, you accepted induction into the Pen, Inc. Second Chance program, is that right?"

Wiley nodded.

Adele continued: "I specifically asked to speak with you, Mr. McClendon, because Texas has what's considered by many to be the most humane way, if that even applies, of administering the death sentence in this country. Yet here you are, obviously suffering a great deal from—"

"The Big C," Wiley rasped. "Yeah, I got it bad." More coughing.

"That's my point, Mr. McClendon. You see, there are many people in a position of power, Senator Lackland among them, who feel that the Second Chance program is *in*humane in the extreme. And, frankly, seeing you here today, I'm inclined to agree."

"Well . . . you're seein' me, aintcha?"

Adele admitted, "Why, yes."

"If I'da let 'em juice me in Texas, I'd be talking to Jesus right now, instead of a pretty lady like you. And you'd be staring at an empty bed. What's humane about that?" McClendon wheezed.

"Look, Mr. McClendon, I didn't come here to upset you. You're obviously in a lot of discomfort."

"Discomfort, my ass. I'm in *pain*, lady. I hurt so bad I can hardly speak. But there's two things I ain't. I ain't dead. An' I ain't sorry I put myself here. You see them tubes runnin' in an' outa me?"

Adele, stunned, nodded.

"Well, the doc here can tell ya better'n me about the nano-watchamacallits they got pumpin' through me. Like little microscopic robots. I still got a chance, right doc?"

This time, Feldman reached over and patted Wiley's arm, nodding yes. "Nanoprobiscopes, Ms. Chasrekkar. Na-

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nobes, for short. Molecular-scale machines, if you will. Meant to seek out and destroy human cancer cells, leaving healthy cells alone. Nano-technology is still highly experimental, of course. And, in Wiley's case, not as effective as we'd like. Yet. But each day brings new procedures. New attempts. Revitalized hopes."

Adele bit her lower lip. "Thank you, Wiley, for letting me visit, I want you to know I hope things work out for you." She turned to Villers, making eye movements indicating her desire to exit the room.

As they walked back down the corridor, she said softly, "I'm sorry, Mr. Villers, but if this was the ploy you had in mind to have us reach some accord, you've failed miserably. That, that human guinea pig in there, and what you've turned him into, turns my stomach!"

Villers grabbed her by the elbow and guided her strongly, with much resistance, back into the waiting room. He excused themselves from Dr. Feldman and closed the door before speaking to her in hard tones. "First off, let's not forget something. Wiley McClendon was sentenced to die for the kidnap, torture, rape, and murder of a ten-year-old girl—his own niece." Adele's glare remained unchanged. "There are plenty of people in this country, including a lot of voters in the People's Republic of Massachusetts, who'd call Wiley's present condition no more than a case of the punishment fitting the crime."

"You're barbaric, you know that?" Adele practically spat.

"No, I'm anything but. Wiley *volunteered,* Ms. Chasrekkar. He captained his own ship from the certainty of the death chamber into that cancer ward, knowing exactly what the course was that lay ahead. The cancer cell transplants. The treatment. The pain. And, most importantly, the slim almost nonexistent chance for recovery, which, if it did happen, would only lead to a life-sentence commutation.

"Do you know how many good, decent people are *never* going to have to go through the pain and torment that Wiley's now experiencing as a result of the nanobe research being conducted here? Under, I might add, the strictest supervision to be found in any hospital worldwide? Do you?"

Adele sighed, shaking her head slowly, side to side. At any second, Villers expected her to place her palms over her ears.

"Ms. Chasrekkar, Wiley McClendon is the scum of the earth. If I'd been one of the arresting officers on the scene of the crime during his apprehension, I don't know that I wouldn't have just shot him stone cold dead and tossed down a throwaway pistol, saving the state a lot of time and effort. How's that for being barbaric?

"But instead, Wiley and all the other Death's Row inmates who've *elected* to enter Second Chance, of their own free will and volition—"

"Will you *please* stop that litany, Villers? You use words like 'volunteer, free will, and volition' as if they really mean something. Giving a man a choice between the hangman's noose and concentration-camp medical experimentation is no choice at all, no matter how humanitarian you couch the reasoning. It's cruel and unusual punishment in my

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book, and I'd venture to guess, in the minds of the founding fathers who framed the notion in the first place. Can we go now?"

There was a commotion at Murchison's cell in Block Delta when he marched back after chow. Guards were rummaging through both his and Dupree's personal stuff, and his cell mate was nowhere to be seen.

Bukovski, the senior guard, put forth the situation: "Your bunkie disappeared somehow during chow. Has Dupree said anything to you about a break, Murchison? And before you answer, I better warn you, anything less than the truth will get you knocked from F-One to F-Three quicker'n shit."

Murchison knit his brows. An escape? That was foolishness of a magnitude that had to go even beyond Dupree's mindset. The black torque each prisoner wore around his neck was, in a sense, nothing more than a battery, DC-AC converter transformer, capacitor and micro-circuitry that could discharge, when the proper signal was given, a lethal fifteen amp current. *Any* attempt to remove it without the correct input code resulted in instant death.

And, if you were to move farther than one hundred feet from the outer wall of Pen, Inc., again without the proper code input—*zap!*

In the few years Pen, Inc. had been in operation, more than a dozen inmates had 'Gone Over The Big Wall' by using proscribed tools to cut the torque. It was quick. And certain. But none had escaped.

"Boss, not a word," Murchison answered in all candor, "he's been his usual surly-assed self, but if he had something working, he kept it from me."

Bukovski started to say something, changed his mind, then told Murchison to clean up the mess they'd just made. With that, the guards left, locking down the cell.

"Asshole," muttered Murchison, under his breath. Only he didn't quite know who he meant, exactly.

"As long as you're here, Ms. Chasrekkar, would you like to see the mess facilities? Each Felon Class has its own mess area, which is part of our attempt to use positive reinforcement as behavior modification."

They were back in Villers's office suite. The conversation had swung slightly in the direction he'd intended for awhile, after he'd shown her videos of the Class One and Class Two Felons performing job functions that not only provided restitution funding, but also the capital necessary to keep Pen, Inc. on the march toward the "P" side of the P&L sheets. Additionally, it gave each inmate enrolled in the program three highly vital requisites for life *after* incarceration: Skill, responsibility, and self-esteem.

"More Skinnerian brainwashing?" she asked, half-jokingly.

"Yeah, the men eat it up," he responded.

"OK, I've still got a lot of time before my Owly Bird hyperjet leaves Hartsfield for Logan. Why not?"

Villers took her through the admin wing, rather than back through the cell blocks. Even a model prison like his wouldn't show itself off in its best light

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if an attractive woman were to walk through.

Chow was over an hour past. A few F-Three trustees were mopping up as he pointed out the differences in each mess hall. "Like to see the F-3 kitchens? I bet they're a long way from some of the sweatshops you've seen, even in the best of institutions."

He was showing off the cleanliness of the F-3 food processing line when, from out of a utensil pantry that seemed impossibly too thin to hide a human being, came a darting shadow; Villers was jumped and thrown to the floor.

She saw Villers go down in a heap, and like a deer caught in the high beams of an oncoming eighteen-wheeler, did nothing but froze in place. Then the attacker pounced on *her*.

Before Adele's adrenaline had coursed through her system enough for her to make the fight-or-flight decision, there was an arm about her throat and a carving knife at her neck.

She tried to scream, but a strong, large hand clamped over her mouth and an accented voice demanded, "Scream an' you die, lady, you got dat?"

Villers was on his feet in an instant and just as quickly sized up the situation. He did not at first recognize the prisoner holding his guest hostage. There were over 8,000 inmates at Pen, Inc. But he could see by the glint of desperation in the man's eye that he meant business.

"You the man, aintcha?" Veonzell Dupree rasped at Villers.

"I'm Villers. Nobody's been hurt yet, let's keep it that way, OK? I don't know your name."

"Can't learn 'em all, huh Villers? Veonzell Dupree, soon to be an *ex*-guest of yours."

Unbeknownst to anyone present, Anthony Villers sub-vocalized instructions, which were transmitted by his mastoid implant.

Even as he did so, Adele Chasrekkar felt the bite of the knife at her jugular and her composure began to dissolve like a sand castle at high tide.

Murchison was standing at the front of his cell, a small, blunt-edged stainless steel shaving mirror held in his hand just outside the bars, angled to let him see if anything was happening out in the block.

He knew that all throughout the institution activity was taking place at a frenetic pace. There'd never been a successful breakout at Pen, Inc. That didn't mean that there hadn't been attempts. During this one, everyone was locked down.

He watched two guards, both familiar to him, race down the corridor, then stop abruptly in front of him. One produced a plastic card which he inserted into the slot adjacent to Murchison's door. The other stood aside as it slid open with an hydraulic hiss. "Murch, come with us. We're not gonna need this, now, are we?" he pseudo-asked, displaying an ugly torque control device. Murchison shook his head no. They formed an escort on either side of him and double-timed it towards the mess area.

"No one's been hurt yet, Veonzell," Villers spoke softly, "we can still work

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this all out."

"Doan be first-namin me, man," Dupree hissed, his knife still at Adele's neck. "Name's Dupree, you got dat? And you doan get me a ride outa here, *fast,* I'm goan waste the pretty lady. If you thinkin' of lightin' up my necklace, Villers, doan forget, whatever juice you pump through me's gonna go right into her, too. Never thought about that in your 'scape-proof prison, huh smart guy?"

Villers sub-vocalized, *Is that true?* A response came back to him via the mastoid speaker, so that only he heard, "Don't know, Mr. Villers. Never had this come up before." That was Noah Cohen, his chief of security, plugged into his net since the emergency began. "But my educated guess? No. The torque's effective because it discharges so close to the brainstem. However, I dunno, if his hands are sweaty. . . ."

Adele's face twisted into an ugly mask of terror and Villers's main concern was that she'd pass out or bolt. Either action might make Dupree try something nasty.

Just then the guards showed up with Murchison in check. Villers's hope was that Dupree's cell mate might be able to ameliorate things. Or, at least, command Dupree's attention long enough to—

"Murchison!" Dupree squealed with obvious pleasure. "You comin' with me, man. Cain't believe this, they bring me you."

Murchison took in the scene in three or four sweeps of his vision. This was bad, real bad. He didn't know who the woman was, but the knife at her throat made him feel nauseous. "Aw, Jeez, Vee, come on, man, this is dumb. Plain stupid-ass dumb."

"Dumb? You shittin' me, man? Got me a ticket out, right here in my hands. Ain't that right, Villers?" He pushed the point of the knife home and a bead of blood formed when Adele flinched.

"Let's talk about that, Dupree." Villers took a step forward, then stopped when the other's grip around Adele tightened in response. "OK, OK, nobody's going to try and come near you. Only let up on that knife, you've cut her. That torque around your neck gets switched the second anything happens to her, you know that, right? She's only valuable to both of us alive."

He saw Adele shudder.

"Nothing to talk about. I want a car, full tank of gas, nobody follows me, 'cause she's comin' along for the ride. And this *thing* from offa my neck. Couldn't be more simple, sparky."

Villers turned to one of the guards, standing next to a visibly shaken Lenny Murchison. "Go find Cohen. Tell him I want a car, full tank of gas, ASAP, brought to Portal D. And the torque-cutter." When the guard hesitated, not believing the capitulation in Villers's voice, he was told, "Now!"

Villers turned again to Dupree. "OK? See? Nobody gets hurt. We just wait two or three minutes and this'll all be over. Do I have your word Ms. Chasrekkar will be unharmed and set free once you feel you're in the clear?"

"My *what?*" Dupree shot back. "You gotta be kiddin' me." He went into a diatribe on the foolishness of Villers's request, which was exactly what

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Villers had prayed for. He used the time to sub-vocalize to Cohen. *I hate to do this, Noah, but Operation Morpheus, on my count. One, two—*

"Goddamn, boss," Cohen cut in over the inductive speaker, "that means all of D-Block—"

—three. Hit it, Cohen!

Adele was almost in medical shock. Her legs were rubbery and she wished Villers could somehow activate the torque around her tormentor's neck and damn the consequences. How could this be happening to her? A wildly out-of-place scene kept running through her mind, like a tape-loop. Just two days ago she'd been laughing with her boss, Senator Lackland, how they had Anthony Villers right where they wanted him.

Murchison hated Dupree at that moment. But he also despised Villers for allowing the situation to get this far. And why had *he* been brought in? He started to say something to Dupree, who was droning, no, *ranting* on and on, when, without warning, he felt a wave of vertigo, the way he'd often felt as a kid when he stood up too quickly from lying down on the floor in front of the TV. The world swam, he saw people all about him—Villers, the guards, Dupree—collapsing like rag dolls; his own knees buckled and there was a sense of dull pain as his head hit the floor.

Then nothing.

Adele came to, the round face of Dr. Feldman leaning over her. "You're all right," he assured her in that special voice doctors use. "Just a slight nick on the neck and maybe a sprain from falling, but you landed on Dupree so you had kind of a bony cushion." He smiled at her.

"What—?" She croaked it, more than said it.

"Villers will be along momentarily to explain everything. He'll want to debrief you, I'm sure. He's just coming around himself in the next ward. You can sit up if you like, but *don't* get out of bed until I say so," he commanded. "Don't want you taking any more headers. Here, use this to raise your bed up a bit." She took the control from him and watched him leave. A moment later, Villers knocked on her door jamb, then entered on what she could see were rubbery legs before she could respond.

"Doc assured me you going to be 100 percent in no time. You could even make your flight out, if you wish. You feeling OK?"

"What . . . the . . . hell . . . happened?" What was that expression Alice used in Wonderland? It came to her. *Curiouser and curiouser.*

Villers smiled warmly, then answered. "Operation Morpheus happened. Our not-so-secret-anymore weapon of last resort." As he spoke, she furled her brow. So he explained, "The chemical name's too long for me to pronounce without dislocating my tongue. But it's an odorless, fast acting neuro-block gas agent we vented from jets in the ceiling. It's heavier than air, so it sinks right away and that makes it easy to purge out."

"Neuro-block? Is that . . . dangerous?"

He paused before answering, phrasing his response carefully so as not to

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make light of the question. "Compared to what? A riot? A stolen knife at your neck?" He could see she didn't like his polemics, so he switched tactics quickly. "No, it's not harmful in and of itself. I twisted my back when I passed out. Dupree cut himself rather badly in his leg—you fell on the knife when you toppled onto him. Murchison will have a headache for a few days and some of the inmates have a few sprains and abrasions. But the effects of the gas pass rather quickly. Well, *you* tell *me*. Feeling funny from the experience?"

"No," she admitted. "Just groggy, like after a Sunday nap when you've had a margarita or two at lunch, know what I mean? Wait, you said inmates. You gassed the entire prison?"

"No, thank God. The system's set up block by block. So just the D-Block—including the mess area we were in—got it." He sighed. "Too bad. Operation Morpheus was an ace up my sleeve I'd hoped to keep in reserve, in case it was ever needed."

"You can't use it again?"

"No, of course we can. But the element of surprise is gone. The hoards of psychologists we hired as consultants when we took Pen, Inc. off the drawing board and put it into action, forewarned us that the inmates would be easier to control if they didn't know of its existence. Water under the bridge now, though."

"Is that why you didn't use it immediately?" Villers almost flinched at the brittleness in her voice; her muzziness was dissipating like morning fog in the rising sun.

"Not really, no. It isn't *instantly* effective, as you probably noticed. It was never designed to be used in a life-threatening hostage situation. It's more of a riot-quelling agent. You know, an anti-Attica tool. I had to wait until Dupree was distracted or disoriented enough—that's why I sent for Murchison, his cell mate—so that he wouldn't use the knife before he went down for the count along with the rest of us."

"Speaking of which, what happens to *him?* To Dupree?" She shivered, when she invoked the name.

"He was already on the bottom rung here. I'll have to consult with my staff. My guess is therapy, behavior mod sessions. I'm not giving up on him. Of course, he'll face new charges and a trial. After your testimony, the judge may yank him out of the program at sentencing. Who knows?"

"So you don't have all the right answers?"

Villers discerned there was no cruelty in her voice, as there might have been earlier in the day. "Never said we did. Any more than, I suspect, you or Senator Lackland have all the right questions. Listen, I've got to get back to my office. Place is a beehive, for some strange reason." He smiled at her. "I'll get one of my people to drive you to the airport, whenever you're up to it."

She pursed her lips. "Is there a decent motel nearby?"

He stopped at the door and turned, puzzled. "Sure. Holiday Inn, just down State Road 32 in Naperville. Why, too tired to trek on back to Beantown?"

"Nope. Irish mother. Too obstinate to let a little thing like a life-threatening hostage situation cut my fact-finding tour short. I have a feeling there are a lot more facts to be unearthed and I *know*

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there's a lot more I want to see. You have time for me tomorrow, by any chance?''

Was that a bit of playfulness in her inflection? Villers scratched his chin in mock thoughtfulness. ''I'll talk to my real boss, Pamela. See if she can't get out her shoe horn and Vaseline, and squeeze you in.''

They both laughed softly. Villers gave a wave and left.

It had been quite a day. She hated to admit it, but that charismatic aspect of Villers's persona that she so often found repugnant in other ''captains of industry'' she'd dealt with was balanced by a vulnerability that was almost boyish. Or was that just another calculated Villers's ploy? For some reason she couldn't quite fathom, it didn't matter. In spite of all that had passed, she was looking forward to the next day and going one-on-one with the man whom she had, that very afternoon, regarded as an adversary, but now somehow thought of as more of a sparring partner. That they had to fight was ingrained in both of their hard-wiring. But maybe no one had to go down for the count.

Adele got up out of bed and looked for her shoes. The hell with Feldman.

Leonard Murchison was back in his cell, slightly buzzed from the pain reliever the Doc had prescribed to him for a bone bruise on his hip he'd taken in the fall. X-rays had showed his head was fine. It was nearly ten o'clock and the pandemonium the gassing had created was now a memory in Cell Block D. Almost.

He was lying on his bunk when he saw the guard bringing someone to stand in front of his cell. The visitor was back-lit, and it took Murchison a moment to recognize who it was.

''Lenny. Heard about the hubbub. You OK?''

''Hey. O'Mara. Didn't know I was allowed to have visitors on the block,'' he kidded, standing up to face his work-program supervisor.

''Yeah, well, Pope Villers the First gave me special dispensation. Anyway, I just wanted to come by and make sure you were hangin' in there.''

''Yah, sure, swell,'' he said, reassuringly. ''Nice you thought of me.''

''Don't be silly. Glad to see for myself you're not hurt or anything. Well. Gotta get home to the ol' ball n' chain. Don't want her to think I'm out carousing. You know how I'm always bragging about Muriel's jealous streak? She thinks I'm a hunk.'' O'Mara rubbed his pot belly, then his fingers over his bald pate. He chuckled, then put his hand out. Murchison shook it, awkwardly, through the bars. The guard said nothing.

''OK then,'' the supervisor said. ''Get a good night's sleep and I'll see you on the job, bright and early, buddy.'' He turned and left.

Murchison blamed the analgesic pill for the warm glow he felt as O'Mara walked away. But a word echoed through his head as he lay back down on the bunk, and the feeling it generated covered him like a quilt comforter.

Buddy.

He fell asleep quickly. Work to do tomorrow. ■

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The Alternate View

TECHNOLOGY AND FUN

G. Harry Stine

Because we believe that technology is expensive to develop, we often have the impression that technology doesn't have that much impact on our everyday lives. We think it's super-powerful. (It is.) We think it will destroy the world. (It won't.) We think of high tech as very serious stuff. This isn't the case.

Technology is fun.

This statement doesn't come from one who is an unabashed techie nerd who loves technology for technology's sake at the expense of everything else. Many people think this way, and I'm glad they do. They are sometimes the ones who are developing a lot of technology for very specific, serious applications. To such people, technology *is* fun. In fact, it's everything.

A lot of other people develop technology for fun.

The statement is typical of what I do in these columns. I try to take an alternate view of the whichness of what herein. Sometimes—usually—it provides us with a better perspective about what's going on around us.

The word "technology" comes from the Greek root *tekhne* meaning "art" or "skill." Therefore, at its very roots, technology is nothing more or less than a way of doing things. It incorporates the concept of expertise.

"Fun" includes the idea of play and includes the emotion of enjoyment. Most animals, humans included, like to play. My golden retrievers play with one another, and both of them play with the cat . . . and all of them enjoy play. It's fun. They give definite physical, visual signals that they are indeed playing in spite of bared teeth, snarling, barking, hissing, and batting. But the dogs never bite one another or the cat, and the cat keeps her claws in. Some people don't play that gently, of course. However, in general, play is non-hurtful competition that may or may not be "for real"—that is, the outcome usually doesn't affect the probability of the Sun rising tomorrow morning. However, the results may produce an exchange of valuta because human beings like to bet on the outcome. One horse will always run faster than another. As Heinlein pointed out in "*Stranger In A Strange Land*," betting and gambling have an extremely high sexual content. Gambling may even be a substitute for sex, albeit a poor one in the comparison. I try to keep this in mind every time I visit Las Vegas (commonly known in the local vernacular as "Lost Wages"). And I'll let you figure out exactly what I mean by that statement! (None of your business, buddy!)

Now that we've defined our terms in the best thesis and debate manner, what in the world do technology and fun have in common?

Look around you.

Consider how much technology lies behind our current ways of having fun.

And even our old ways of having fun.

People in every world culture use

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technology to a greater or lesser extent in the ways they have fun in that culture. The North Americans, the Europeans, and the Japanese probably incorporate more technology in their fun than any other cultures on Earth at this time.

Our grandparents applied a lot of technology to having fun. Have you engineers out there ever thought about the structural analysis of the indeterminate structure called a "roller coaster"? Especially one made of wood? Edison's gramophone wasn't developed as a device to record sounds for historians. Nor was the radio (wireless) developed exclusively to communicate with ships at sea. The entertainment value ("fun") of these technologies accelerated their development.

I would submit that the present day flight simulator industry owes a great deal to computer gaming. PacMan is the literal father of the Boeing 767 simulator. And the Boeing 757/767 "glass cockpit."

Going beyond that, it's possible to see how enhanced entertainment value has driven the technologies supporting motion pictures and television. A good comparison familiar to readers is the difference between the special effects (SFX) of "Star Trek" and "Star Trek: The Next Generation." A quarter of a century separates the two series. Yes, the budget for "ST: TNG" is bigger (all budgets are bigger today), but even with all the money in the world, the SFX would be impossible without the technology.

A spin-off of this motion picture SFX technology created the modern theme amusement park. Disney did it first. The Mouse still dominates the field like an 800-pound gorilla. If you can remember to think about it as you're getting the hell scared out of you on one of those rides at Disneyland/World or Universal Studios, think about the incredible level of technology behind those illusions.

And that's just what most entertainment is: *illusion*. Even fiction. The people in the motion picture and television industries are masters of illusion. This technology and other technologies are finally creeping into what I consider to be the most conservative of all the entertainment industries: publishing.

Do you realize that with all the books I've written, I've had the pleasure of dealing with only one publisher who will accept a manuscript on a floppy? Editors want it in paper format (hard copy). It will probably remain that way until the supply of blue pencils runs out. Once the editor is finished with the paper format hard copy, he sends it to the typesetters who key it back into a computer. But this is only one of the problems of the publishing industry. Most book publishers do not use technology to determine their markets; they do not know who is reading their books, where they are selling well, or how many of them have been sold. They don't know what *will* sell and they appear to care little about their ultimate customers. As a result, book publishers work by gut feel. I am indebted to Rick Cook for calling my attention to the biggest current problem that arises as a consequence of this: the Stampeding Buffalo Syndrome.

Have you noticed that, in general, the entertainment industry or the industrial complex that helps it create fun is nearly recession-proof? Seen any theme parks

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close? Seen any movie houses going belly-up? Videotape and record stores are doing more business than usual. Over the years, I've noticed that the numbers on my royalty statements do not reflect current, short-term economic trends. We like to have fun even when times are bad. It keeps us from blowing our tops.

We apply an enormous amount and variety of technology to doing a better job of having fun. The sport of skiing has transformed the cold-weather clothing industry. Basketball has changed the design of our shoes.

You see, technology application runs in a feedback loop. Where a problem arises that can be identified as a desire, it is also identified as an opportunity. Technology is then sought for problem-solving purposes. The technology can and does come from a wide variety of sources. Technology jumps the artificial boundaries of industries (and nations). It is applied to solving a problem. It can be applied to a product or a process for making a product. The new application suggests other applications to smart, attentive people. The conservatives laugh.

They laughed when I told them that the cryogenics technology being developed for the X-30 National AeroSpace Plane could be used to freeze Popsicles faster with less waste. They stopped laughing when I pointed out that this would have a major impact on profits in an industry with annual sales of $12 billion. They didn't realize the size of this commercial market, and it drew their attention when the money numbers were in terms of billions!

(Popsicles are fun. We don't have to eat them. We do it for fun. If technology can make them better, faster, and cheaper, then here's yet another example.)

The failure to realize that we apply technology to having fun was one of the shortcomings of the 1949 market analysis made for IBM, who had just developed the Selective Sequence Electronic Calculator (SSEC). The savants found no real market for computers because they determined that nine SSECs would be adequate to handle all of the data processing and scientific computing tasks of the entire United States for decades to come. When the computer hobbyists and gamers got hold of the computer and began having fun, we ended up with more computer power in a four-function watch calculator than the vacuum tube SSEC.

A similar market analysis was made in 1950 for commercial jet airliners. This serious study concluded that the world demand for jets was 250 aircraft.

Aviation is an area where we apply technology to have fun. "Sporting" or "fun" aviation not only got the industry going but has continued to produce innovations. We use aviation today as part of our recreational package, but we don't think much about it. I like that. It means that if we do our work right, the same can and will happen in space transportation because a market exists for trips to orbit. All we have to do is apply the technology properly.

We can thank the amateur radio buffs for a whole series of technology applications they made in the course of having fun. At the moment, the model rocketry enthusiasts are doing the same thing by upgrading their technology

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rather than by downgrading military technology to fly higher, faster, farther. For example, the fin-mounted attitude control rocket motors on the *Pegasus* satellite launch vehicle are up-graded model rocket motors. And in the process of applying this fun technology to serious space transportation purposes, the technology came full circle within a year to produce the first reloadable, reusable model rocket motors.

Our ability to use high technology to have fun literally scares the living hell out of some people from other countries.

Several years ago, I took a Czech friend of mine to Disneyland. He had a ball, of course. But he confided to me later that it scared him. "I saw so much very high technology," he told me. This statement came from an engineer in one of the most industrially and technologically advanced countries of Eastern Europe. "In our country and in the Soviet Union, all of this technology would be a big secret for the military. Here, you use it to have fun! I am wondering what kind of technology your military people are keeping as big secrets!"

Well, we saw some of that recently during the Baghdad Air Show. It didn't surprise many of us that the technology worked and worked very well. This doesn't mean that we fought the Kuwait War for fun, but that the military technology reflected the sort of reliability and workability we expect of entertainment technology. When we have fun with technology, we insist that it works! If it doesn't, we either don't buy it again or we get busy fixing the problems with technology for fun and profit. ■

●The right word may be effective, but no word was ever as effective as a rightly timed pause.

Mark Twain

●Pessimism is only the name that men of weak nerves give to wisdom.

Mark Twain

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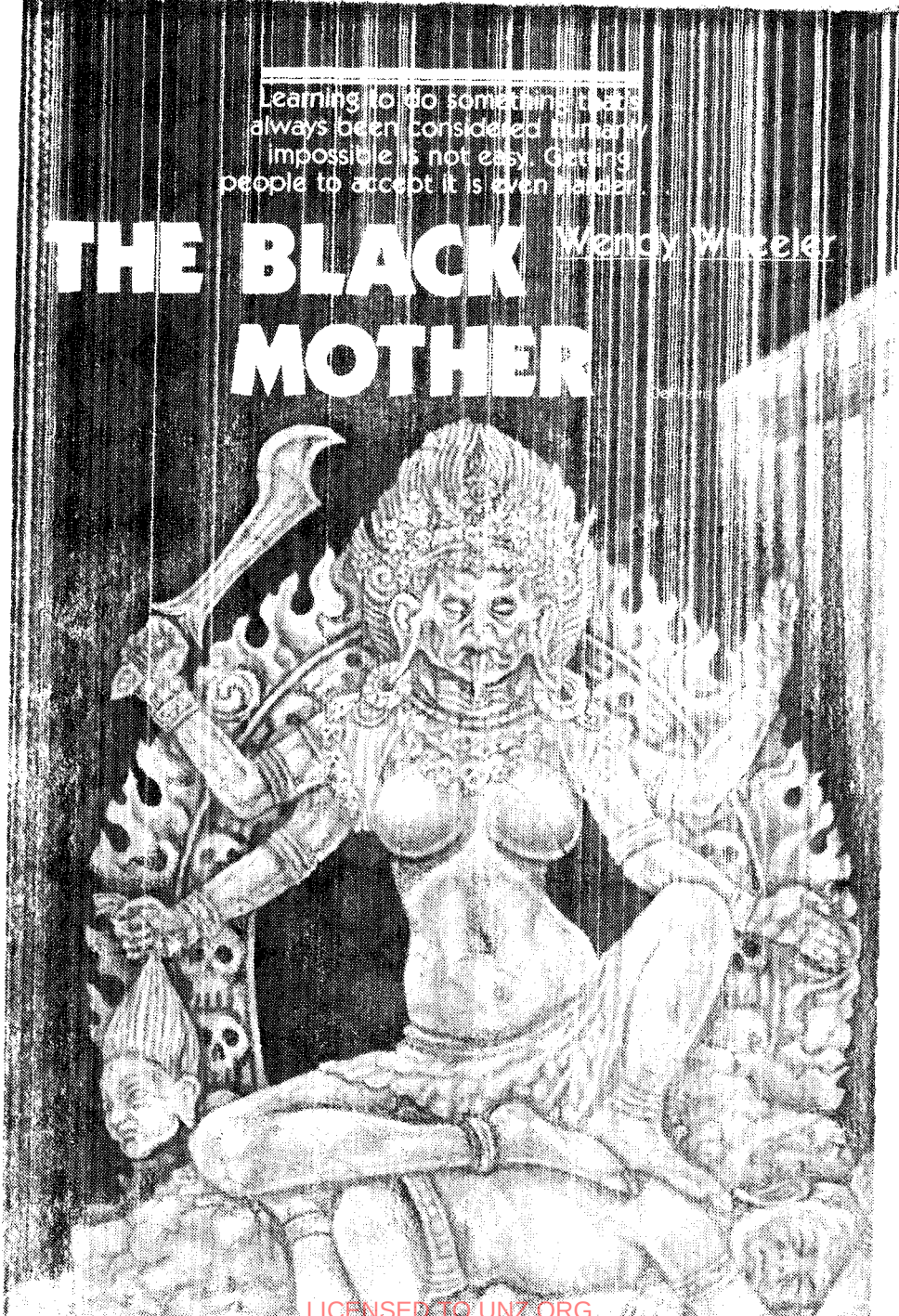
Learning to do something that's always been considered ultimately impossible is not easy. Getting people to accept it is even harder.

THE BLACK MOTHER

Wendy Wheeler



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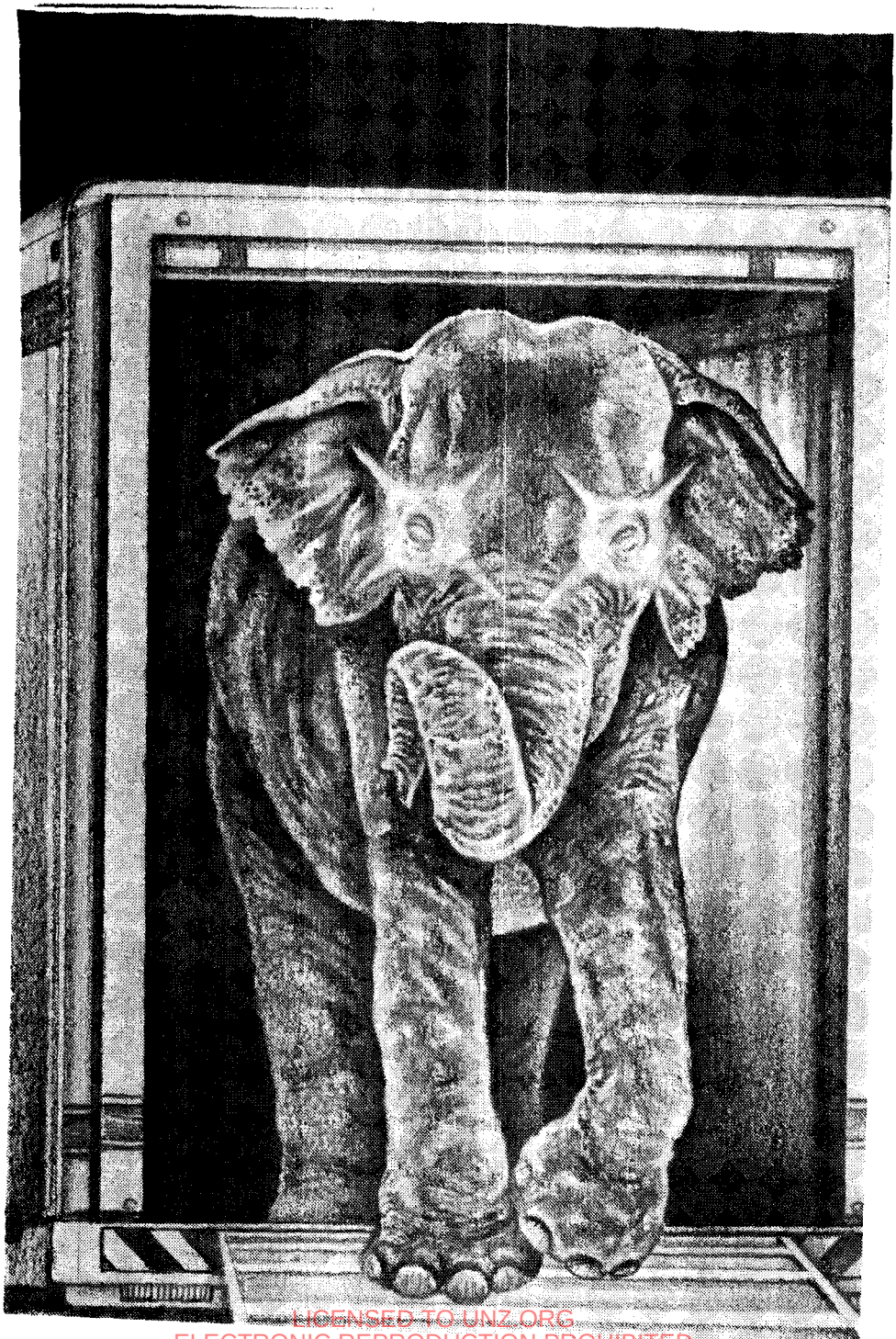

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A mahout in Nepal honors the Hindu god Ganesh by touching both hands to his elephant, then to his own forehead. Ganesh is often reincarnated as an elephant, these drivers tell me, because soon after he was born, his head was destroyed—turned to ash I think, but can't be sure because their English is so broken and my Nepali is almost nonexistent. Ganesh's father, Shiva the Destroyer, found him an elephant head as a replacement. "Gee, thanks, Dad," I picture Ganesh saying, "you think anybody will notice?"

I keep thoughts like this to myself now. These days I imitate the gestures of the mahouts, touching the cold, grey skin of Shana-Kali and then touching my forehead. The Nepalese watch this from the corners of their eyes. I am the only one to touch the elephant they have named Shana-Kali, the elephant they think is a demon. It may be months before I make them understand.

The mahouts, who drive the elephants, and the elephant trainers have a word for me, too, another Hindu word, though the majority of Nepalese are Buddhist. Pandu, they call me, "the pale one," for my blonde ponytail and light brown beard. The rest of the world calls me Hank Goldman.

Sometimes I get the odd impulse to put the whole bizarre situation down in a letter to my mom. The reclamation project, the culture shock, and ideas for finishing touches on my thesis.

Then like a kick in the gut I remember.

A part of me still insists that the body working at that chemical plant somewhere near Tucson is my mother. It's crazy; I know it's crazy, but I still imagine it. Yeah, I could write her a letter, but why send it off? The words wouldn't mean a damn thing to that microprocessor in her brain.

Not a damn thing.

It was nearing the end of the monsoon season the day I brought Reclaimed Subject Seventeen to the Royal Chatwain Wild Game Preserve. The flight to Kathmandu had been rough, the challenge of getting a necropachyderm into the country made even harder by news of another Chinese deployment in the northwest. I hired a truck driver and got Subject Seventeen into a bobtail lorry. The driver was a wiry older man, almost toothless, who wore a leather bombardier's jacket over his green cotton *lungi*.

"How can you stand it this warm and wet?" I asked him. "I feel like I'm in a dog's mouth."

He just grunted and started the truck. It was about ninety miles from Kathmandu to the preserve. We drove through cramped streets packed with people, past Buddhist and Hindu temples. Finally, the town behind us, we passed small farms with rows of cabbage like green buds on the black earth.

The closer we drew to the preserve, the twitchier I got. To distract myself, I pointed the grassland of the Terai out to the truck driver. "That's elephant grass over there, where most of the game lives."

He just nodded.

The grass on the flood plain grew almost twenty feet high, tall enough to get a person on foot hopelessly lost, and too thick to drive through in a Land Rover. The grass itself had razor edges that could cut a person to ribbons, and

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anyone on foot ran the risk of stumbling onto a rhino and being gored to death. The grass made working in this part of Nepal a singular problem.

"They have the elephant," the driver told me after a while in his old man's lisp. "The elephant walk good through the grass."

I slapped his leather shoulder. "Absolutely right, my man!" An elephant *was* the only thing that could hack the grassland of Nepal.

He nodded and grinned. "Elephant very expensive. To take revenge on an enemy, we say, buy him an elephant."

We rolled up to the gateway of the park where a guard typed us into her clipboard and passed us through. As we approached the largest of the rain-damp porticoed buildings of the office complex, Ida and an immaculate small man in a turban and grizzled beard came out to meet us. Lagging behind were three or four Nepali men in *lungis* and sandals.

"*Namascar!*" Ida stomped up in her stiff bird-boned way, her grin so big it deepened all the wrinkles in her neck. Dr. Ida Sapperstein had been at Chatwain for the past twenty years, a key player in the reestablishment of its animal population. "Gonna check out life in the wild, eh, Hank? Get down outta that truck and let's see her."

Her enthusiasm did a lot to calm my nerves. But still, it seemed pretty deserted for one of the last three game preserves left in the world. "Where is everyone?" I asked, sliding off the high truck seat.

Ida wore glasses on a chain around her neck. It was like her not to have her vision laser corrected. "Oh, the Rapti River's come out of its banks with all the rain," she said, gesturing with those glasses. "The crew is out making sure none of the tigers were cut off."

The small man in the turban cleared his throat. He was obviously a devout Hindu; I saw the *tilaka* painted on his forehead. Ida turned to him.

"Oh, Vish. Sorry. Hank, you've never met Dr. Vishnu Chandra. He acts as manager of the preserve, in addition to his research." Ida touched my shoulder. "Dr. Chandra comes to us from the University of New Delhi."

"New Delhi?" I said. "Really? I've been working out of their Shankara Research Center—"

"For the reanimation process, I know," said Chandra in excellent Oxford English. "I am most interested in how this is done. Keeping an animal corpse in stasis as the fetus comes to term is one thing. Many, many tigers we have placed back into the wilds of Chatwain that were helped by these females reclaimed from the dead. Also rhinos, gaur, antelope. That program is a great success, but I must ask you, sir, why do you do this other thing?" He steepled his fingers and narrowed his eyes at me. I looked from his crisp, white cotton to my wrinkled, sodden khakis and wondered how he did it.

"Chandra," Ida said in a warning tone.

I could feel my jaw getting tense, but managed to shrug. "It's OK, Ida. I've been getting this same question from my research associates for the past three years." Reclaiming dead animals for use as surrogate mothers had brought back most of the great endangered mammals. The procedure had been ac-

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cepted, acclaimed even. But I proposed even more. I proposed the reanimation of the needed worker animals. Necrozoologists like Reuben and Peterson insisted the plan was impractical. It was a small victory that I had this one beta site to test an animal in the field. This was my chance. My one chance.

"The elephants are crucial to being able to do your work here," I said. "Yet India's ban on capturing and exporting their wild elephants has been in place since the 1980s. And even the calves we place from the surrogate programs take at least twenty years to mature. The need is there, and I can fulfill it. I say . . . " Though Ida was nodding, Chandra stayed impassive. Some of the fervor went out of my voice. "I say there is more we can reclaim from the animals lost to us."

"Ah, but a comatose elephant gestating an implanted fetus is quite a different thing from an active, functioning animal." Chandra's elegant voice was slightly scolding. He looked significantly at the back of the truck.

"Your cue, Hank!" Ida put on her glasses. "If this works, it could make things so much easier here. We've been up the Rapti without a paddle more times than I like to count. C'mon, c'mon. No more dawdling!"

I suddenly realized that most of my sweat had nothing to do with the heat. Moments of high stress always make me silly. I held out my arms and cocked my head. "It's show time!"

"Where's the remote control?" Ida said, laughing.

"Don't have one. Subject Seventeen works on vocal commands." I pulled the bolt on the bed of the truck. The ten-foot doors swung open. From the dark, orange sonar eyes glittered. "OK. Now understand, we've got only the gross programming done. The refining process will have to be done on-site." I bolted the truck doors back. "Seventeen, walk forward." The truck started to creak as the huge grey animal began to move. First into the light was its high knobby forehead. The dark skin of Subject Seventeen was unusual for an elephant. Very dark, except for where it showed pink with age at the edges of its ears. The trunk was curled under its chin in a rigid spiral. The massive forequarters followed, then the great horny feet.

In three steps, the elephant was to the doors. Everyone gasped and stepped back, except for me. I knew its sonar would tell it to stop before it fell off the truck. Sure enough, Subject Seventeen halted with one foot raised and froze in place.

"The ramp," I said to the truck driver. He looked at me, then at the elephant. He knew something was odd, but he couldn't figure out what. Finally, he threw down the *tej* leaf cigarette he'd been smoking and sidled toward the switch as if a cobra lurked inside the truck. He tripped the lever for the motorized ramp, and then stomped back to the cab of the truck without a word.

"Subject Seventeen, come down the ramp." The elephant moved down the ramp in a careful, though jerky, walk. It was propelled by a flat metal galvanic unit that rode its tailbone like a miniature howdah. One precisely placed foot, then another, settled on the damp ground.

I looked over and saw that the lips of

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the Nepalese were trembling. One man shuddered visibly, and I heard him intone, "Shmashana Kali, Shmashana Kali . . . "

" . . . Sh—shana Kali?" I asked. Kali, the Hindu goddess, I had heard of before. I didn't know this other name.

"Kali, The Black Goddess," said Chandra, his tone perfunctory. "She is the Terrible One of many names whose stomach is a void that can never be filled, whose womb is giving birth forever to all things. Shmashana Kali is her aspect that lives in the cremation grounds surrounded by corpses and terrible demons." He cut his eyes toward the shaken Nepalese and seemed to smile. "Did you not think of the effect these reanimated creatures would have on the cultures to which they're introduced?"

"Well, yes, I—I—" My stuttering was interrupted by a heavy thump. I turned around to see that the electronic proprioceptors inside Subject Seventeen had given out just as she'd come off the ramp. She lay in the mud like a huge grey bag.

Later that day, I came into the main room to find Dr. Chandra and two other student researchers staring at a map on the computer screen that completely covered one wall. Across the map, which I now saw was a 3-D aerial view of Chatwain, hundreds of bright yellow lights flickered. Ida talked rapidly into the mike of a shortwave. Tension fairly crackled across the air in the room.

"What's wrong?" I asked Chandra, who was focused on one of the dots of light and pulling at his beard.

He didn't take his eyes off the screen. "One of the tigers," he said shortly. "A female. She took refuge from the rain on the west bank of the Rapti and now the river's come up and surrounded her."

"This is her signal?" I pointed to the light that absorbed Chandra's attention so. Chandra nodded.

"—Number 44344," Ida barked into the microphone. "Doesn't it show up on your laptop? Right, right. Just due south of where you are now the river is low enough to cross. It's Mamie! If someone can't get to her soon—"

"Send Chanchal!" said one of the students. "She's closest—"

Ida put her hand over the receiver. "I'm sending Chanchal," she snapped. "But no elephant can make it through two miles of that dense grass in any less than—"

"It is too late," said Chandra, his voice quiet. I saw the yellow dot on the screen had turned a muted shade of blue. "The tigress is dead."

"Damn it," said the first student. "Damn it. She was the best breeder, the best foster mom. One of the last seventy Bengal tigers left alive. If we'd had the elephants placed better . . . "

Ida had turned back to the radio and was muttering into it in a defeated tone. Chandra put the tips of his fingers to his closed eyes and rubbed.

"There is too much to do, too much," he said. "Five elephants are not enough." He took his hands away and looked at me. His eyes were red. "You see our need, Hank Goldman. Do you have our salvation?"

I started having the dream again at Chatwain.

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In the dream, my mother comes into my bedroom to tell me goodnight before she and one of her husbands (who, this time? Bob? Adrian?) go off to their dance at the country club. I'm in my bed, wearing the flannel cowboy pajamas she bought for me every year until I was twelve. In my dream, my heart leaps up because this is her! *This* is the mother I remember. I see her guazy dress, tight at the waist to show off her figure. I see her necklace of matched pearls with its sapphire pendant. I even smell her Italian Rose perfume. I want to hug her back, hold her forever.

But when she puts her hands to my cheeks, her skin is chill and slack. I try to pull away, screaming without sound like you do in dreams. She doesn't notice; it's like she's programmed not to. She bends close to kiss me, and her eyes are the faceted orange globes of sonar sensors.

The rest of Ida's crew didn't show up for another two days. Chandra provided me with a large, clean work room and offered his help with my supplies.

"This'll be great!" I told him. "Thanks! I was afraid Ida was going to be the only one pulling for me in this thing."

Chandra folded his arms and stepped back. "Why do you think no trainers or mahouts have been assigned to you, Dr. Goldman? They were told about your coming and all have threatened to run away. You have much to prove, much to overcome before you truly see anyone else here 'pulling for you.' " He spun on his heel and walked off. My ears burned for two hours after he left.

I spent the two days removing the bugs from Seventeen's motor sensors and programming her to respond to commands in Bhojpuri, the language these Nepalese mahouts used with their elephants.

I had just refilled the nutrient sack in Subject Seventeen's stomach through the valve in her side. I was walking her in rapid circles around the yard of the office complex so the fresh fluid would circulate more quickly through the tissues.

I heard faint shouts and the rumble of distant engines. From the direction of the far off cloud-covered Himalayas approached a motley collection of jeeps, animals, and people. As they drew closer, I saw the trainers running alongside their elephants while the mahouts sat astride the howdahs. The jeeps were laden with people, tracking equipment, and other supplies.

I waited until all but a few had reached the yard and were staring at Subject Seventeen in consternation. The other elephants were a much lighter hue than her, making Seventeen appear almost black in comparison. Trying for a good first impression, I halted her jerky circling by using the new Nepali word. "Subject Seventeen," I said. *"Roh!"*

I should've signaled her to slow down first, because the command to stand still after building up so much momentum almost tipped her forward. But the now-enhanced motor routines cut in and kept her standing.

"Hoy, there," said one of the tanned figures on a jeep from behind its sunglasses. It took off its wide-brimmed straw hat to show a mass of curly auburn hair. "I'm Astrid. You the fellow from the Shankara Center?" Her smile was

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wide and genuine.

"Yes. Pleased to meet you. I'm Hank Goldman."

"We've been waiting for the circus," called someone else. "You going to do some tricks for us?" This was the challenge I'd expected.

"Why, sure." I patted my pockets and feigned embarrassment. "Oh no, forgot my juggling pins. Oh well. You'd rather see Subject Seventeen do tricks anyway, right?"

"Subject Seventeen?" said one of the nine piling off the vehicles. From their khakis and blue jeans they were obviously the researchers here—the mahouts and trainers all wore multi-colored *lungis* wrapped from waist to knee. The speaker was a swaggering American kid with black hair. "How about that?" he muttered to a companion. "Doesn't even give the thing a name."

"Oh, this creature has been given a name," said Dr. Chandra, appearing from somewhere. His white cotton turban was spotless. "Man Bahadur and the others have entitled her Shmashana-Kali." At this, the Nepalese inhaled together in a single hiss.

"Shana-Kali," one said.

"I don't think that name will be appropriate—" I began.

"I've told you all about the exciting work Hank is doing," Ida said, coming up behind Chandra. Her tone was very jolly. "We've needed another elephant for years now. This animal of Hank's may be the answer to our prayers."

"I'm still refining its programming," I said. "I was hoping to do some tests and measurements on your best-trained elephant so I can replicate motor responses to all the usual commands. Um, any suggestions on which one?"

The mahouts and trainers stood alongside their restless elephants a good two dozen yards away from Seventeen. One of the beasts raised its trunk and blared a call as if to challenge Subject Seventeen. In the awkward silence that followed, Astrid looked over from where she and the other researchers were running their hands across the skin of the reanimated elephant.

"Chanchal is our matriarch," she said. "The oldest and wisest elephant of them all. She is the best one for this honor, right, Gyan?" A mahout nodded with obvious reluctance, then put his thumbnail to his mouth and nipped at it furiously.

"Never thought I'd see a reviv'd elephant," mumbled the American so that I could hear him. "Whole damn idea gives me the creeps."

Ida sat on the bed of my spartan room in the dormitory hut while I tapped that day's journal into my laptop. Her wiry hair was a muted shade of taupe. She picked up the framed holo from my nightstand. "And who's *this* gorgeous blonde creature?"

All my life, people had made the same mistake. I kept her picture with me anyway. "That's my mom," I said. I hoped my tone would dissuade her from further questions. It didn't.

Ida whistled and put her face closer to the glass. "When was this taken, then? Before you were born, I bet."

I let a long moment go by. "That was taken when she was forty-eight, about five years ago. She always took excellent care of herself."

"I'll say," said Ida. "I'll be sixty-

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five this year and I'm nothing but a mess of thin bones and leathery skin. Pretty soon they'll be bringing my ashes down from the *ghat* in the High Field."

"*Ghat?* You have a crematorium here?"

"Yeah, for the Nepalese workers, and sometimes for the honored animals after they've been autopsied—if they're not going to be reclaimed, of course." She looked toward the window. "It's where I want to go when I die." She gave me an embarrassed grin. "Poetic as hell, huh?"

"Yep." I kept plugging away at the keys.

Ida cocked her head. " 'Took excellent care' you said? You mean your mother is dead?"

"Cerebral hemorrhage."

"Ah." Ida put down the holo. "I'm sorry." But she was sharp; I guessed she'd read about the "Able Body" Act. "Excuse me if this is painful, Hank, but did she go into a coma and . . . ?"

I sighed. This was Ida after all, unfailingly kind to me and a powerful woman to have on my side. "Yes, two years ago she went into a coma and was pronounced brain dead. The state reclaimed her body for dangerous work and put it into the reanimate work force, somewhere in Arizona they told me. So, yes; my mother is now a reviv."

Her tiny bird eyes were sharp on me. "But I hear with a little money and influence, you can evade the reclamation process."

My chest felt squeezed and my voice got high. "You can. But why would I? What kind of necroscientist would I be if I'd applied for a waiver like that? A hypocrite, that's what. No, you've got to stand up against that kind of superstition, in all its forms."

"Do you?" said Ida. She yawned and stood up. "I'm outta here. Early day tomorrow." At the door she stopped and turned back. "I hear Astrid takes a pretty mean holo." Then she was gone.

I looked down at my screen. Somehow I'd set the key pad on numeric lock. For the past few minutes I'd been typing garbage.

I had been overseas working on my master's thesis when the blood vessel burst in my mother's brain. She was between husbands at the time, and I was her only child. Friends of hers sat with her in the hospital where, as they said, she lay in her irreversible coma looking so young and beautiful it was hard to believe she'd gone. No one thought at the time she'd be claimed by the state; she was too old. But my mom had spent her whole life keeping her body young and vigorous.

The state moved in fast, saying the allotted two weeks had passed with no word from next-of-kin. The fresher the tissues are at the time of reclamation, you know, the longer the reviv lasts. By the time I got home, she'd already been reclaimed and placed. I kept insisting the Reclamation Office tell me where she was, that I had to see for myself that my mom was gone.

No, they said, it was their policy not to release information on the whereabouts of specific reanimated subjects.

I threatened them; with my newly acquired inheritance I had more than enough money to buy a waiver and get her body back.

That's when they dug into my back-

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ground and found I was well on my way to being a necrozoologist. A canny director spoke with me and appealed to my sense of science. As a student of the process, surely I could see I was being unreasonable. It was hard for some of the more superstitious to accept that a body was not the person it had belonged to. *We* understood, didn't we, that once a person died, the body was little more than a piece of machinery best employed to save the living from dangerous and unpleasant work. What would my thesis committee think, he said, if they heard I suddenly developed such qualms?

So I left. I went back to Europe, I got my masters. But it never seemed real. My mother's death, I mean. It was the ritual that I missed, I think. There's a reason man created ceremonies to mark the great transitions of life—christenings, weddings, funerals. It's not so much to honor the one in transit, I think, as it is to cue the rest of us on where to place them.

Astrid and I sat on the rolled up mats and bundles that had been tied to the back of Shana-Kali. I'd given up on convincing the mahouts to give Subject Seventeen another, less intimidating name. Now it was left for me to make her name an asset.

We rode through the tall grass and scrub trees at the end of a line formed by the five other elephants. Somewhere ahead we expected to find two newborn rhino calves who were neither on our census nor fitted with the customary tracking implants. I was pleased at the way Shana-Kali used her trunk to move the grass aside in the thick parts, the way she settled each foot in before moving another. The on-site programming had gone well, once I'd convinced the mahout Gyan that no harm would come to his precious Chanchal.

A few days before, I'd slipped a series of subcutaneous sensors into the skin of the lead elephant's legs, head and trunk. Two other, more sophisticated, sensors I inserted into key ganglia at either end of Chanchal's spine. All the field data so collected I'd downloaded into Shana-Kali's microprocessor. The resident software had refined the movements, deciding which opposing muscle groups would need to be called into play to make the responses smooth and natural.

I sat with my legs on either side of Shana-Kali's neck. On either side of me were Astrid's long tanned legs. My mother had always claimed a tan was an invitation to early tissue damage. She'd used sunblock religiously, the same way she'd kept her diet free from preservatives and taken Nu-Hormone shots every five years. All my life she'd so much energy for that, and so little for me. And what did it finally get her?

I could smell Astrid's clean detergent-washed clothes over the wild citrus smell of the Murraya shrub. She'd been the only volunteer assistant for this field test of the reanimated elephant. While I wished for more acceptance by the other researchers, I wasn't unhappy with this arrangement. Astrid and I had stayed up talking several nights after the others had gone to bed. Astrid had a great mind. And great legs.

I pulled from my pocket a flat pod-shaped stone about the size of my palm, and handed it to her.

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"Why do you have this?" she said. She peered at the rough carving, which was a many-armed figure with a ferocious skull's head, long tongue, and a necklace of human bones. From between the widespread legs issued all manner of animals and plants.

"I was hoping you could tell *me*. I asked Dr. Chandra and he just laughed so hard he couldn't speak. I mean, I'm sure it's the goddess Kali, but why did I find it in Subject Seventeen's stall? It was smeared with blood when I picked it up, too." I could still almost feel the moist stickiness on my fingers.

"These are old Hindu stones, meant to represent a woman's . . . private parts. Hindus put them around various places to ask favor from the Black Mother Kali. In the old days, she demanded blood sacrifices. This one looks pretty new, though." She shrugged and handed it back. "Only superstitions."

A few hours later, the calves still not found, we halted for a mid-day meal in a clearing in the grass. The trees around us were bent and spare, and steam rose up out of the ground. I brought Shana-Kali alongside the other elephants, ignoring the mutters and rolling eyes of the trainers. *"Cul,"* I said, and she put out her foot so we could scramble off. We left her standing motionless on all four legs as the other animals grazed, rumbling happily like motorboats deep in their throats the way elephants do. Dr. Chandra whispered to the mahouts as I walked away. One of them spit in the direction of Shana-Kali.

We'd barely sat down to our meal of rice and lentils when one of the live elephants began to trumpet, and all of the others joined in. We heard thumps as they began to bang the ground with their trunks.

"They see a tiger!" cried a mahout. We ran toward the animals. I understood the situation in a instant. There was no tiger.

The live elephants had completely surrounded Shana-Kali. They alternated between trumpeting, thumping the ground, and slapping at her with their trunks. Chanchal, the largest, kept shoving Shana-Kali in the side with her head. The trumpeting grew more threatening.

"Chiii! Chiii!" I cried, running closer to slap at the elephant nearest us. She ignored me. "Help me drive them away!" I called. I thwacked another elephant on the flank. She lumbered sideways toward me, forcing me into the circle of animals. All around me the elephants were throwing their heads back, slinging their trunks around, stomping the ground with their great horny feet. I felt the ground shake, and looked for a way to escape. "Make them stop! Make them stop!" I was almost screaming.

The elephants didn't stop until the mahouts got involved, slapping them in the side and prodding them with goads to move them away.

"Bad judgment, running into the middle of enraged elephants. They take their cue from their trainers. Ah, these backwards Nepalese," said Chandra. He called over to the mahouts. "You see? I told you your beasts were too sensitive for this."

"Yes! They know this one is dead, Pandu," Gyan told me. "And having her nearby will call in demons. Take her away! Take her away!" The other

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Nepalese stood with their backs to me, coaxing and calming their elephants. Even the researchers wouldn't meet my eyes.

I stood there on the steamy soil of the Terai and felt years of work turn to shit. It was all I could do not to scream.

Astrid rode back with me to the office. She slid up close and tried to comfort me by wrapping her arms around my chest and holding me tight. Any other time, I would've followed up on such an obvious cue, but I was despondent. I had primed Shana-Kali with the proper pheromones, I had programmed her with their own gestures and commands. What else did the other elephants need?

As Astrid murmured comforting words, I could feel her chest vibrating against my back.

Vibrations.

"Ah!" I said. "The language of the elephants!" I slapped my leg. "Shana-Kali isn't saying anything to them!"

Astrid's lips were on the nape of my neck. "How smart of you! You're talking about the subsonic frequencies the elephants use, right?"

Elephants communicate in a sort of secret language below the threshold of the human ear. Shana-Kali wasn't giving off the right sounds, so the others felt threatened by her. I had a plan already, a plan that involved a sophisticated audio recording system and playback device. . . .

Suddenly, my heart felt a lot lighter. I picked up Astrid's long legs and crossed them in front of me. She giggled, as Shana-Kali continued her steady tread across the grassland.

* * *

The final straw was the blood sacrifice.

The vocal programming had been a solid success. I'd set Shana-Kali up so that any subsonic rumblings from a nearby elephant worked as a command for her to begin her own bubbling refrain. It was a continuously repeating message that said to the other elephants, "I am happy, I am content, I wish to help." I'd been out in the field with her almost every day for the past two weeks, and had no more problems with the other animals rejecting her. The animals were fine.

Ida, too, was ecstatic, and the other researchers were impressed. Even Robin, the arrogant American, had snorted and slapped Shana-Kali's side in approval.

But the mahouts and other Nepalese would come no nearer. This despite the fact I was there with them every day, I used the Bhojpuri commands with Shana-Kali, I made the obeisance to the elephant-headed god Ganesh as they did. The success of the project required I place Shana-Kali at Chatwain and move on. But if I had to act as mahout the rest of my life . . .

One morning I went into Shana-Kali's stall and saw three dark streaks painted on her broad side. I touched them and found blood. Not hers, for Shana-Kali had no more blood, and her nutrient fluid was a pale yellow color.

I stepped back and almost tripped on something on the floor. It was the headless body of a kid goat. I started to retch and almost tripped again, this time on the bloody head. A garland of flowers had been wrapped around the severed

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neck. Something snapped inside me then, and I went looking for Chandra.

He was in the computer room penciling notes as he watched the map of Chatwain on the wall screen. "Just monitoring the wild bison," he said as I came in. He was as crisp as ever.

I held the bloody thing out by one horn, its tongue lolling, its dead eyes glazed. Chandra finally lost a little of his composure; his eyes narrowed and his jaw clenched. "What the hell do you make of this, Chandra?" I asked him, my voice raw. "Just what ironic and elegantly disdainful comment do you have for me now? I found this lying at Shana-Kali's feet. And someone had painted three stripes of blood across her flank. What is it? A joke, maybe? A joke from these backward Nepalese?"

His tone was low. "A—a propitiation, perhaps."

I put the thing down on an old sheet of fax. It felt like my breath was burning my lungs. "Ever since I got here, you've taken every chance to cause discord about my project. What is it about the whole matter that disturbs you so, Chandra. What?"

He shrugged, but I could see he was uneasy. "It is a novel idea introduced into a culture that is slow to take up new ideas. Is it not fascinating—"

I stepped up close. "That's all, Chandra? Just an intellectual exercise for you? Oh, really? Let's see, you've got your doctorate in what? Zoology?"

"Comparative anatomy."

"Comparative anatomy. Uh-huh. Quite a westernized education. Yet you seem to be a very devout Hindu. Ever have any problems with that, Chandra? Any internal battles between science and superstition? Any conflict that you maybe enjoy seeing played out in the people around you?"

"Not—not at all," he sputtered.

Something inside me just ripped then. My scholarly distance deserted me. I touched my forefinger to a pool of the goat's blood. "Then you understand that this is just plasma and hemoglobin, don't you?" I showed him my gory fingers, "and when I do this, it means nothing." I dabbed the red stuff on his forehead, on the place marked by the *tilaka*.

Chandra gasped and flinched as though I'd hit him. He put a trembling hand up and touched the blood. "Oh, what have you done? What have you done? Marked me with the red of Kali, marked me as Hers—" He broke into a spate of frenzied Hindi as he pulled a handkerchief from his pocket and rubbed at his forehead.

"Not superstitious about such things are you, Chandra?" But I began to feel guilty.

"I am not a backwards man!" he snapped. "I am a cultured person, at ease with many intellectual subjects. I—"

He looked at the blood on his handkerchief, then seemed to wilt. "Yes. A part of me is uncomfortable with the dead being yet alive. I—I am ashamed that a voice in my heart will not listen to the logic of my mind."

I sighed, thinking of the letters that had almost been sent to an address in Tuscon. "I know that voice, Chandra. I sometimes wonder whether all the education in the world would silence it."

Chandra looked at me, once again composed. "Why would you want to

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silence it?''

I took a step back. ''Why, you just said—''

''I said that sometimes my heart will not listen to the logic of my mind. I would never silence it. To do so would risk the beauty and metaphor that bring power to our lives.''

I snorted. ''Not the words of a true scientist, Chandra. If I can't quantify it or qualify it experimentally, if my senses can't perceive it, then it doesn't exist.''

Chandra shook his head. ''Perhaps to you such things do not exist. You're dealing with a people to whom demons are very real. Does this mean there are dimensions to their realities that do not exist in yours? I think you believe in the intangible more than you think.''

''Hah!'' I said. ''Prove it!''

Chandra reached over and gently took the crumpled piece of fax paper from me. ''If this fluid was merely plasma and hemoglobin to you, my friend, you would not have continued for the past five minutes to scrub all traces of it from your hands.''

I looked at my hands, almost chapped from the rubbing I'd given them. I know I blushed. When I finally spoke, my voice was hoarse and timid. ''It's not the same thing. . . .''

Chandra smiled and shrugged. ''Blood is a symbol, as well as a subject for study. As is your elephant. I do not think you have ever quite grasped just how powerful a symbol your reanimated elephant can be. The Black Mother, containing both death and new life. A profound metaphor . . . ''

There was that mother goddess thing again. ''What *is* it about this Kali, Chandra? Are you supposed to fear Kali? Love her? What?''

''Here.'' He pushed me to his work station and made me sit. In a moment he'd logged onto the Net and called up a database on Eastern religions. While he went to wash his face, I scrolled through screens of incantations, legends, and doctrine written in Sanskrit centuries ago. When he came back, Chandra pointed out a few beliefs in the discipline of yoga. Among other things, a yogi gained the ability to overcome the eight great obstacles of the world, the eighth being the power of bewitching and subduing by magical means.

''Fascinating stuff, but my project's still in jeopardy.'' I said.

Chandra smiled and scrolled through a few screens. ''Here. Here it says, 'to make ghosts, female goblins, and other demons of the netherworld become his slave, a yogi must meditate at midnight in a cemetery, burning ground, or place where criminals are executed while seated on a corpse.' '' He stopped and looked at me significantly.

''Seated on a corpse . . . ?'' I groaned. ''This is crazy! We're worse than superstitious if we do this.''

Chandra spoke coaxingly. ''With the right words, a little subtle guidance by me, we may further convince the mahouts that whoever commands an animal able to grant power over demons also commands the greater part of the Netherworld. Their own fears will make this attractive to them.''

''Chandra—''

''Think of it as a synthesis,'' he said. ''Creating acceptance of your beast by using the metaphor of religion.''

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He finally sold me. As I got ready to leave, he tore some hard copy from the printer, one of the graphics from the Net's database. It was a portly dancing form with eight arms and an elephant head.

"Ganesh?" I said. "Why do you want me to have this?"

"Pray to him," Chandra suggested. "Ganesh, son of Shiva and of Kali, is also called the Lord of Obstacles. His aid is to be requested on any new endeavor."

"Hey there, big fella," I said to the paper.

So that is how I come to be here, sitting atop Shana-Kali this balmy night, feeling more than a little foolish, with a *tilaka* painted on my own forehead. The coarse hairs of the elephant prick me through my khakis. I use no howdah tonight, more for effect than anything else.

The area they call the *ghat* at Chatwain is little more than an arrangement of paving stones and low ledges in whose cracks remain the powdery ash from past cremations. In the distance, I can see the firefly lights of electric torches. The mahouts and trainers have come to watch this, I know, their superstitions fanned even hotter by the murmurings of Dr. Chandra.

I call out in a resounding voice, "By this mastery over the darkness and over Shana-Kali, comes mastery of many things. Hear me now as I claim power from the gods themselves." I unobtrusively click the recorder at my belt on and the tiny remote in my ear comes to life.

Only I can hear the Hindi phrases spoken in Chandra's elegant voice. There is a pause after every group of syllables so that I can repeat them, still in the same stentorian tones. I read the translations of the Rig Veda and other sources earlier so that the meaning of some of what I am saying remains with me.

I call upon Agni, first, for welfare;
I call upon Mitra-Varuna, here, for aid.
I call upon the Night, who brings the world to rest. . . .

Who will be the first to volunteer for Shana-Kali, I wonder? I had seen the mahouts looking at the elephant with new eyes the past two days. To a superstitious man, power over demons is a very attractive thing. I begin to feel optimistic. Surely once one of the mahouts work with Shana-Kali, they will all demand their turn. Somehow, I suspect it will be Gyan who first comes forward. Now I see the torches are brighter. I catch a glimpse of excited faces.

My mother, Kali, is of a black complexion only because She is viewed from a distance. When intimately known,
She is no longer so.
Bondage and liberation are both of her making;
Through her grace worldly people attain their freedom. . . .

Something shifts. I feel it—like a chemical reaction. I can feel old bonds being torn within me. That part of me that had such aversion to, such fascination with superstitious talk, that part of me I denied, seems freer somehow. Power and metaphor, I think.

Even as worn out clothes are cast off
And others put on that are new,

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So worn out bodies are cast off
By the dweller in the body
And others put on that are new.

In the drama of the moment, those old words from the Bhagavad-Gita take on new meaning. My work has caused me to focus too much on the ephemeral body. I believe in an eternal soul, I realize, as strongly as I believe any law of physics. I close my eyes and seem to smell a hint of Italian Rose perfume. I feel a touch on my cheek, my mother's touch of farewell, and once again her hands are warm. ■

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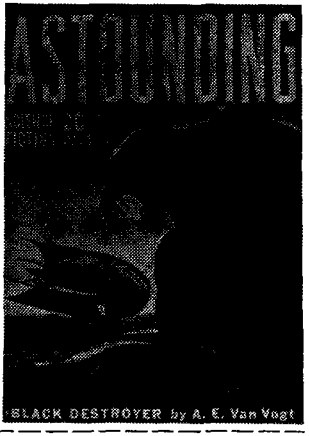

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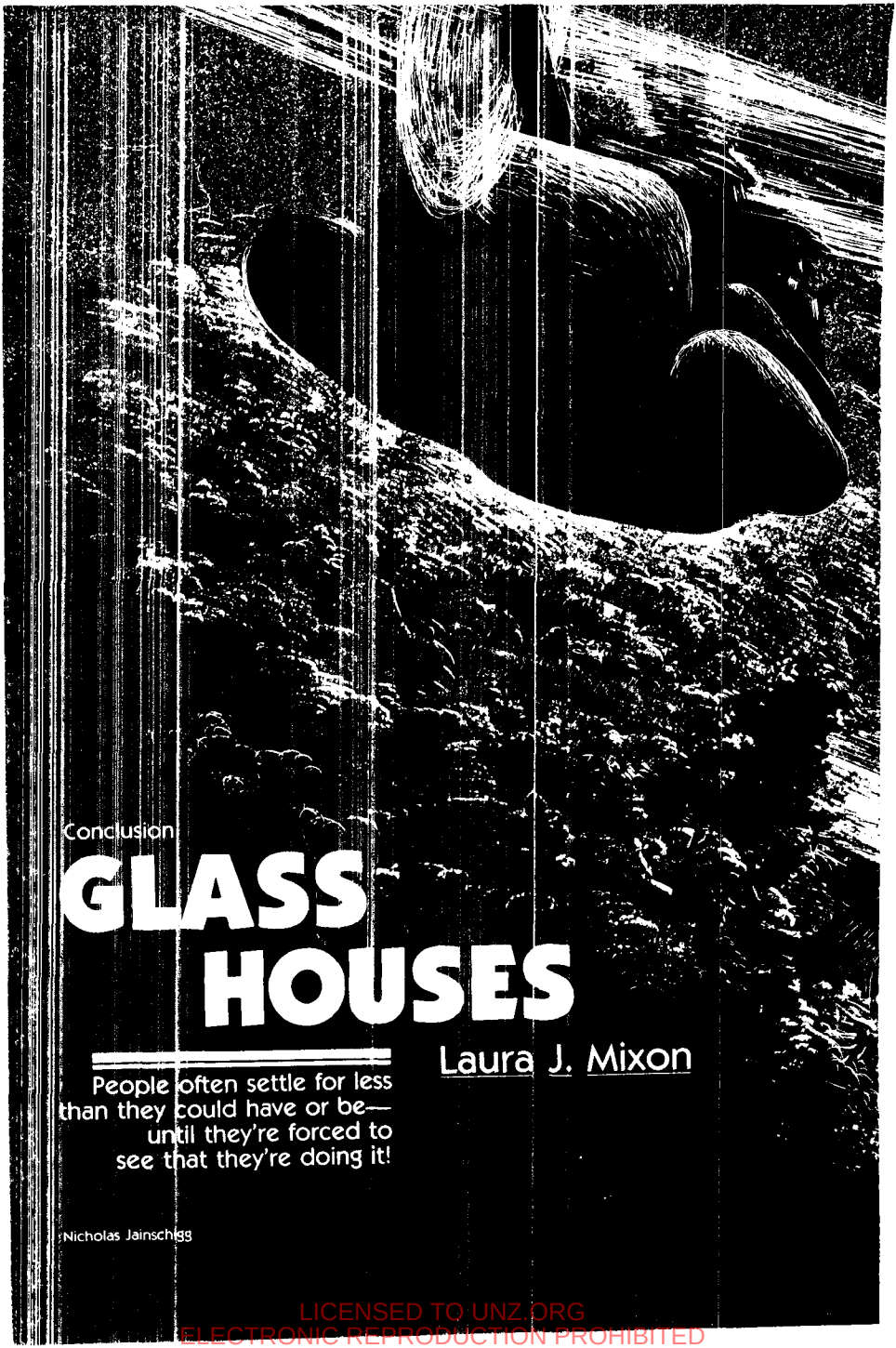

Conclusion

GLASS HOUSES

Laura J. Mixon

People often settle for less than they could have or be—until they're forced to see that they're doing it!

Nicholas Jainschigg

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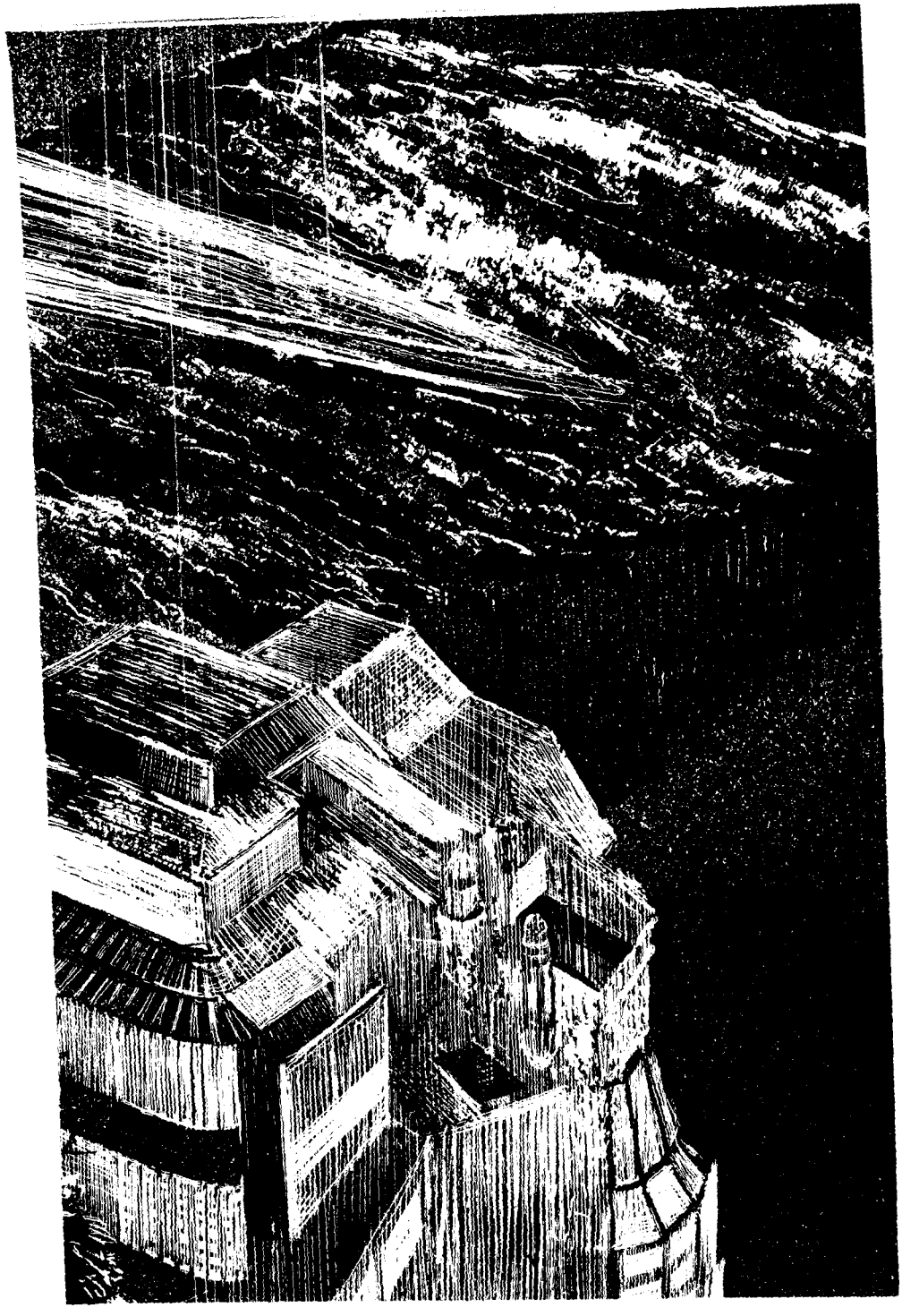

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HAVE I GOT TROUBLES—
A SYNOPSIS

My big, recycled ugly of a waldo, **Golem,** *is supposed to take all the risks in these salvage jobs. Me, I'm* **Ruby Kubick,** *waldo wrangler—and when Golem goes out I'm just along for the ride. Sit home in my Queens apartment, drink beer, watch jellovision, and connect with reality through my three waldos—Golem, Rachne, and Tiger—and the beanlink in my brain, is the way I like it.*

But when I–Golem found a wealthy old man trapped in an abandoned skyscraper just in time for him to be crushed to death by several tons of steel and concrete, things changed fast.

I-Golem tried to save old **Youhanna Nasser,** *and failed. My Golem was severely crippled in the attempt, too—and impounded by the police captain,* **Sheila Nanopoulos,** *to boot. But the tragedy had given me and my roomie* **Melissa** *a chance at a new life. Nasser's family was so wealthy they would never miss those eight diamonds he'd worn in his ears, nor the envelope he'd clutched like it was so valuable. So I-Golem had taken a detour to hide them on the way to turn the body over to the police.*

My one hope was secrecy. If I could keep Nanopoulos from figuring out what I'd done, Melissa and I were home free—we could escape the squalor we lived in, start over clean. It was the chance of a lifetime.

I should've known it'd never be that simple. To start with, between Melissa's stepping out with strange men for spending money and my own unruly hormones—OK, OK, I wanted her and she didn't want me; that's the short version—life had gotten tense at home.

Things got even weirder when I recovered the diamonds, and opened the envelope to learn that old Nasser had been on his way to have his last will and testament, a cross, and a note delivered to his son. "Dear **Sidra,** *I was a major jerk and I'm sorry. You're back in the will." And get this: the old man's widow* **Rachel Karam,** *Sidra's stepmother, knew I had the diamonds. And the envelope. And she didn't report them missing.*

Guess why.

Nanopoulos was suspicious, all right—she could smell that something was up. But since no crime had been reported she gave me Golem back, poor wrecked junkbait that he was.

I kept telling myself that it wasn't my problem, what happened with these crazy rich people. My life was tough enough, what with not being able to go outside days without frying because I couldn't afford an environment suit, with Melissa hiding her "fun money" and not helping on the rent, and me trying to find the parts to fix my poor Golem so I could get a quick job to pay the back rent before the landlord evicted us. Even my friend and favorite junk dealer **Mikey,** *didn't have all the parts I needed. It's not like I had a lot of leisure time to worry about rich people and their power games.*

Only there was this screamer, see, who only I could hear, who kept crying for help in the old man's voice. So it was hard to ignore him and his problems, even if he was dead.

I went to his funeral and watched Rachel and her cousin guilt Sidra into going to their mansion for a period of

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mourning. I could tell they were up to something and their lies to Sidra really burned me. But it wasn't my problem. My problem was survival.

So I did an amazing thing. I hid the will and left the apartment. Not in a waldo: me, myself. I tried to sell the smallest pair of diamonds but couldn't to save my life. Jewellers don't trust people who offer to sell diamonds worth hundreds of kilodollars and only take cash. Imagine. I don't know why that surprised me.

I went home to tell Melissa, "It's your turn to pay the rent this time, damn it," and found that a high-tech security waldo—not the landlord—had thoroughly trashed the place. And while I was still recovering from that blow, Melissa handed me the jellophone tube and transceiver. An anonymous caller said I'd better tape the old man's envelope to a commode in Grand Central Station, or they would report me to the police.

Rachel Karam, or one of her flunkies. They'd sent a waldo to search for the will, and since they hadn't found it they were resorting to extortion.

There was no hiding what I'd done from Melissa any more. When I told her, when she saw the diamonds and saw that Rachel didn't dare turn us over to the police for fear of the will being discovered, she got so excited. She had it all figured out.

And seeing from the outside what I'd been living on the inside—such desperate greed, such hunger for wealth that it makes people do anything to get it—I remembered how I'd sworn I'd never be a crook like my dad. And I heard that screamer off in the distance so alone, so despairing: he'd tried to reconcile with his son, and his son would never know now that he had forgiven him and tried to make amends. . . .

That's when I knew I couldn't go through with it, however much it pissed Melissa off. (And did it ever.)

But I was resolved. Somehow, I had to get the will, along with the diamonds and the cross, to Nasser's son—who was locked away in Rachel Karam's mansion.

The trick was, how?

PART II

REACH OUT AND TOUCH SOMEONE

The netphone slot swallowed my last five dollar coin and after a series of clicks and noises, a robotic operator thanked me for using NYNEX. Mikey's face appeared onscreen, rubbing the sleep out of his eyes.

"Sorry I woke you."

"Ruby, hey. No prob. What's up? Do I spy e-books and carrels in the background?"

"Yeah. I'm at the New York Public Library."

"You look like hell."

I made a face. "What a pal."

"What are you doing at the library?"

"Frying my brains."

"On a controlled substance? At the library? I didn't think you were the type."

"On research. Beat it." This last was to a kid telling me to get off the phone. "Mikey, I need help."

"The way you're saying that it sounds serious."

"It is. I need two favors."

"Go for it, chica."

My guts slithered into a knot. "Can I"—saliva filled my mouth, and I had to

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swallow before I continued—"borrow a few hundred dollars? Could you transfer it to my account, um, right now?"

His toothy, overbitten grin came to his lips. There was sympathy in his eyes. I knew the look. *I've been there,* it meant.

"Is that all you need? Hell, I can do that with my eyes closed. Five hundred OK?"

My skin flushed hot—I couldn't figure out whether I was relieved, embarrassed, or irritated by the favor. "I owe you. Five hundred's great. Thanks. I mean it." I clamped teeth together to keep myself from babbling on any further. He gave me a nod.

"You got it. Give me your bank account code."

I transmitted it to him and he put me on hold. I chewed a hangnail while he was gone, till it tore loose and set nerve ends to screaming, and then sucked on my finger with a mental curse.

When he came back he had a toothpick in his mouth. "Mission," he said, "accomplished. How long you gonna need that money for? Not that I'm in any big hurry, just want a rough idea."

"I—don't know yet, actually. Hopefully not too long. Which brings me to my second favor."

"Well, go on," he said, grinning encouragement, when I stalled again. "Worst I could do is say no, right?"

"Yeah, OK. I need you to make a phone call."

He seemed surprised. "I must be missing something. You made it sound like something tough."

"It may be tougher than it sounds. The person I want you to call is in a place that may make it hard to get through."

"No problem. I do phone calls for free, for friends. You gonna tell me who to or do I have to guess?"

I gnawed at the flap of throbbing skin that dangled at my nail. "Well, it's a little complicated."

He gave me a penetrating look. "What kind of trouble you in, Ruby?"

" 'Mon." The kid tapped my shoulder. "Hurry." His breath was hot on my bare shoulder. He was a skinny kid with high-topped sneakers, baggy *shorts, netgloves, earphones. I couldn't* even see his eyes through the glaze of dim sparks running through his bug-eye network shades. *Virtue* junkie. No telling how his software was translating me into his private universe.

I opened my mouth to tell him to blow away, but something about how he looked stopped me. He was awful young and I guess I felt a little sorry for him; it occurred to me that I had been acting like a junkie myself, lately. A Melissa junkie.

I turned back to the phone. "Someone's waiting for the phone, Mikey. I'll be at your place in an hour and a half."

WE PLOT AND PLAN AS BEST WE CAN

"Mister Nasser isn't in right now," the ghost lips said. "May I take a message?"

"Do y'all know when he'll be back in?"

"I'm sorry; that information isn't in my files. Would you like to leave a message?"

Mikey gave me a questioning look from where he sat across the room with the jellophone, when I peeked around the corner. I shook my head.

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"Nah," Mikey said, "I'll try to reach him later. Thanks very much."

I came around the corner as he broke the connection.

"Just like you predicted," he told me.

"I know he's in there." I glooshed down in the gelbag beside him and worried a fingernail. At this rate, I'd be chewing bone in hours. "The thing is, we have to get to him before midnight. Otherwise that crazy rich woman will send her mechano-goon after me again, and people could get hurt. Like Melissa."

"So call her," he said. "Tell her to get out now. She can come over here till y'all get this settled." When I didn't say anything, he added, "What you waiting for, permission to use the phone?"

I stared at him, feeling bleak. What was I supposed to tell him, that I was terrified of facing her; that she'd probably take a knife to me the next time she saw me?

"You're right," I heaved a sigh and took the phone transceiver he offered. I dialed our home number but the jello-tube stayed blank. After the twelfth ring, I disconnected and gave him an apprehensive look.

"That envie woman don't know you ain't gonna play her game yet," he said. "Melissa's probably just gone out. Or she's asleep or something."

Or, I thought, she's killed herself because I was so shitty to her that she's given up hope, or she's gone away forever; she'll never forgive me. . . .

"Not in that mess," I said. "Nobody could sleep there. And Calen's probably already showed up and stolen whatever he could get his hands on that wasn't broken, because she probably didn't pay the rent. I shouldn't have left her there alone."

Mikey frowned. He shook his splintered toothpick at me, a mild rebuke. "Look, everybody has fights sometimes. She's a grown woman. She's not gonna shrivel up like a pansy just 'cause you hollered at her a little."

"Yeah, I guess."

"You done the right thing, Ruby, deciding to return the diamonds and will and all. It's not your fault she took it hard. And if what you said is true, it's past time she should pay the rent, anyhow."

"Yeah." But in my thoughts her lips were pressing against mine, her fingers ensnaring themselves in my hair. Desire stirred in me, reptilian and mindless. And I remembered the terrible, ashen look on her face when I'd made that accusation and wanted to curl into a little ball. "Yeah, but I didn't handle it too well."

"I bet it was pretty rough, letting go of all that money."

I nodded and gave him an unhappy look. "I could have used that money. I could have kept her away from sleeping around. She only does it because she needs money."

"That ain't the only reason she does it," Mikey said, softly.

I frowned at him. He didn't know Melissa; I did. And I couldn't help thinking that I'd finally had something that made her want me and I was throwing it away.

"I bet I know what you're thinking," Mikey said. "But nothing you do's gonna change her ways. It don't matter

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how much money you got or how hard you try. You can plead, you can holler, you can keep paying all the bills. But no matter what you do, she'll keep doing what she does till something scares her bad enough she sees she's got to change. Believe me—I been through it myself."

Then he read the anger in my face. His eyes widened and he rubbed his chin. "Looks like you got some mighty strong feelings for her."

At his words my anger ebbed and my throat tightened. I cleared it and nodded, blinking hard to stop the tears.

"And it's hopeless. She'll never feel the same way I do. I've lost her before I ever had her."

He gnawed his toothpick and looked at me for a long moment. "Yup," he said. "I sorta' wondered if it was like that. Hurts like hell, don't it?"

I nodded. His sympathy stripped away all my defenses and I had to just sit and cry for a while. He patted my shoulder, grown awkward, saying, "There now, there there now."

Then I was seeing the old man clutching the envelope—*more precious than diamonds*—and remembering the look on Sidra Nasser's face—*not in his heart*. I'd done the right thing. The price tag on those diamonds was way too high. And that reminded me of my other problem.

"We're still stuck with how to get his belongings back to him," I finally said, wiping at my eyes and nose with a hanky.

"We could mail the envelope to this Sidra person," Mikey said. "Or better yet, find a friend of his who could hand deliver it to him."

"They aren't going to let him get any packages," I said, "No matter who takes it."

His expression was reluctant. "Then I hate to say it, Ruby, but the only other choice is to go to the police and let them handle it."

"No way I'm going to turn myself in! We'll have to think of another way."

"There is no other way," he said. He stood up and paced a bit. I could tell he was getting exasperated. "Besides, I can't believe he'd prosecute."

"Yeah, right. This guy's going to let me walk when I just stole several million dollars' worth of diamonds—and his inheritance—off his father's dead body."

He looked defensive. "When you just made sure he got it? Come on. If you hadn't taken that envelope, the police would have returned it to Ms. Karam, unopened, and she would have destroyed it."

That stopped me, for a second. "I hadn't thought of that." Then I shook my head. "The police will talk him into prosecuting. They'll tell him I'm out to blackmail him or something. Cops love to prosecute. It keeps them in business. And envie folk are paranoid of us."

He sat back down next to me, looking deflated. "It ain't just cops. And it ain't just envie folk. You never know who you can trust." He gave his head a rueful shake. "But what else you gonna do?"

"Wait a minute," I said, straightening slowly as inspiration bloomed inside me. "I have it. We can do a sort of inside-out salvage. We'll take his things straight to him, inside the mansion."

"That's nuts!"

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"No it's not. Listen. It'll be the last thing they'd expect. I got mega-data on the house at the library; it's some kind of famous architectural feat and they even have art galleries and give public tours. Not just now, I'm sure—but still, we've got plenty of public-access tapes of the house's interior we can use to navigate with."

"You think he's going to be any less likely to prosecute after you break into his mansion?"

"It's not his mansion; it's Rachel's—and there's no love lost between them. And no. If I hand the diamonds right over to him, he's going to be grateful, not hateful." I paused. "Besides, he's not going to have the chance. I'm going to get in, give him what belongs to him, and go. That'll be the end of it."

"You've got to be kidding."

"I'm serious. I'll send Golem in. He's only going to need a few repairs to be fully functional—"

"And where you gonna get the parts?"

I looked at him. "You're going to have to loan me four of Mash's memory crystals. And his linkware station. We'll install it in your new bird and rig it so I can run Golem from Monster Mash's boards."

"No way." He was shaking his head. "I ain't letting you gut my Mash."

"It's the only way."

His jaw set. "No."

I leaned forward, gathered my determination, and met his eyes. "Listen. You know it's the right thing to do. You said so yourself."

"Yeah, so? *You* were the one who made such a mess of—" then he stopped and looked embarrassed.

"You're right," I said. "I did. I messed up. So don't do it for me. Do it because you know there's a guy in that house who's about to lose his entire inheritance because of someone else's greed. I can reach him—I know I can—but I need help.

"I'll give you back everything I've borrowed once I'm done. I'll replace every piece of Mash's equipment that doesn't make it through this." If I didn't end up on the street, or in jail. "I know it's a big risk. But I can do it. But not without you. You gotta help me. Please."

He gave me a gaunt, worried look. He took my hands in his and stroked the backs of my hands with his thumbs. From the look on his face and the way he avoided my eyes, I realized suddenly that he wanted me in the same hopeless way I wanted Melissa. That made me sad.

"Shit," he said. He released my hands and brushed back his mass of loose curls with a sigh. "Shit and shebangles. All right. I must be out of my mind, but I'll help."

"Mikey, thanks."

"Yeah, yeah. OK." A grin struggled back onto his face. "Don't get too mushy, that's all. Us Texan men hate too many emotions getting let out at once."

A NEW LOOK FOR GOLEM

Melissa must have paid Calen—there was no padlock on the door. She'd even started cleaning up a little before she'd left, which made me feel guilty again for leaving the way I had. We retrieved Golem and my tools from downstairs

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and collected as much of my other equipment as we could salvage from the mess in the apt.

Mikey and I loaded the stuff into his van and took it all back to his junkyard. In Mikey's storehouse workroom, I plugged all four of Golem's power packs into their fast-chargers while I cut out and removed sections of Golem's dented chassis.

It took a lot of patching to stop the rest of the hydraulic leaks, and then I rewired and rechipped the damaged circuitry and wiring. With some welds, bolts, and splicing I got his two new arms, the hand-fingered one and the warrior snake arm, secured to the old fittings. The new complement of snake-hand attachments fit nicely inside his main chassis compartment along with the rest of his hands and other tools.

I installed the new camera eye onto his vidi platform. The new camera didn't have IR, but it did have a freeze-and-squeeze window option, which could be useful. Then I ran tests on his new arms, and on the two remaining old ones, the telescope and the schwarzenegger. They all seemed functional. The preliminary visual tests seemed to indicate his new eye was working as expected.

Onto one of his smaller, underbelly compartments I installed a lock keyed to my voice, and then I rolled up the envelope with the will and diamonds, stuck them inside, and locked it. I pounded, cut, and welded the damaged sections of chassis to reshape them and give Golem better structural integrity. Then I stood back and surveyed him.

My weld work on the chassis and arms had covered him with multi-colored titanium oxides—swirls of cobalt blue, parrot green, yellow, and ruby red and purple. A few nicks, scars, and weld burns were all that remained from the accident. Decked out as he was in his shiny party colors, with the two different models of camera mounted on top and his multitude of arms, receptor antennae, wheels, gadgets, and other paraphernalia, he looked like something built by a mechanic with the DTs.

Good old Golem. I tilted the face plate of my welder's mask up, pulled off my Heet-Spunj gloves, flicked away the sweat in my eyes, and then patted him on his psychedelic chassis. You'll do, you old junkbunny.

Where the eye-frying, yellow and pink "WAPL News at 11" lettering and logo had been on Mikey's schick new bird, were now blotches of matte black paint, slowly drying, smelling of turpentine. I tossed my link beanie onto the back seat, along with my tool kit and some spare parts. Nearby, one of the genie cats lying curled at the military bird Monster Mash's open hatch gave me a cold cat look and then yawned, flashing yellow teeth; the other, licking its flank with dignified languor, ignored me. Mikey's legs stuck out of the door—the rest of him was under the control panel.

"How you coming?"

I had to repeat the question twice before his muffled voice issued from inside—"A while yet!"

I looked at my watch. It was about 2:30 P.M. Time to do some homework.

SOURCE OF DIVINE BLESSINGS

Aïn el Baraka, the *Almanet* told me, was a palatial home built up the face of

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the Palisades, overhanging the Hudson. The Hudson River winds down from the Catskills through the Hudson Highlands, gathering water and silt from mountain tributaries. Somewhere along the way the ocean begins to commingle with it, and from there on the river makes its way, slow and salty, southward through the tropical rain forests to the Atlantic Ocean and New York City.

Nasser's mansion was certainly famous enough, but though I'd visited the Palisades as a child and seen pictures of the mansion, I'd never seen the mansion up close and in person—in fact, hadn't even known it was his. According to the syntellect ghost of *Dorian's Almanet of Famous New York Homes, Aïn el Baraka* had been built out from the face of the Palisades, just north of the New York-New Jersey border. It had been "designed and built in 2003 by the famous Moroccan architect Abdallah ibn Ishak under the aegis of the young Youhanna Nasser, then a Harvard lawyer just come into his father's inheritance and a new Coptic sensibility." Whatever that meant.

More importantly, the *Almanet* ghost had downloaded an hour-long, recorded tour of the public areas onto crystal for me, along with a number of three-dimensional floor plans and design details from the Library of Congress. These I promptly dumped to Golem's back-up crystals for later storage in Mash's linkware.

I ran through the tour and then spent another half hour or so studying the house's design and physical features. I could infer some interesting things about their security systems from the uniqueness of the house's design. *Aïn el Baraka* was more than just a feat of engineering; it was a work of art.

Mikey came in, wiping siloxane grease from his hands. I looked up in time to see the rag he'd wadded and tossed come sailing past me to flutter down over the jello-tube, obscuring the archways, gilt minarets, and shining marble of Nasser's mansion.

"This house is incredible," I said. "They've got art galleries, robotics, passive solar supplemented with a cogen plant—"

"—and security up the yin-yang," he finished, with a sour grimace. "Those fancy art exhibits and things ain't exactly good news, Ruby."

"We're going to pull it off, Mikey. Have a little faith."

He gave me a look that said, *yeah, sure*. "The linkware is ready. I put the gigacrystals on the worktable."

I snatched up the rag. The numbers floating above the window, Mikey's jelly clock, announced it was 6:06 P.M. Three hours or so to install the gigacrystals and linkware and test Golem's new parts, maybe an hour to get to *Aïn el Baraka*. That left maybe two hours to break in, find Sidra Nasser, give him his inheritance, talk him into not calling the cops, and get back out before Rachel showed up sometime after midnight. It was going to be close.

"Try Melissa again first," he said, and tossed me the transceiver.

HELLO? HELLO?

She answered on the third ring.

"Melissa. Thank God you're home. I—I'm sorry I walked out, I—"

She gave me a remote look that chilled me.

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"Are things OK with Calen?" I asked in a wavery, high-pitched voice.

"I took care of it." Her tone was flat.

I wondered if she'd paid him in cash or in some other way, like she had before I'd moved in. The thought made my stomach flip-flop.

"I know you're still angry with me," I said. "I guess I can understand. Please, just—just listen. OK?"

Another silence. She folded her arms. "I'm listening."

"These people who are after me, they might show up again. I'm worried for you if you stay there."

She shrugged but didn't say anything.

"Mikey Knowles—you know him? He's the guy who owns the junkyard near the wharf—he says you can stay here if you want."

"Why should I?"

Her snide tone pissed me off. "Because your life's in danger and I'm trying to protect you!"

"Oh?"

I took a deep breath, forced my voice down a few notches in pitch and volume. "Melissa, when I don't show up where they told me to be tonight they're going to be angry. I don't want that crazy woman or her security waldo showing up at our place and hurting you again. Or trying to use you against me."

Something changed in her face when I said that. The hungry, pleading look that came onto her face was far worse than her anger had been.

"What are you going to do? You're not going to do something stupid, are you?"

"No I'm not going to do 'something stupid.' I'm going to make things right again. They haven't been right since I took the old man's belongings."

"What does that mean?"

I didn't answer. I felt like her eyes were drilling holes in my forehead. "Rube. Tell me what you're going to do."

I stared back and emptiness spread like Novocaine through my chest. But I couldn't lie to her.

"I'm going to take them back to his son. Rachel Nasser is keeping him in her mansion. And I don't want her to be able to use you against me when I break in."

Her eyes widened, and tears gathered in them. She held out her hands. "Please think about this. Think about what you're doing. I'm sorry for what I did, before. Come home and let's talk."

I shook my head slowly, sadly. "My mind is made up."

"Please."

"No. Don't ask again, Liss."

Her expression went remote again. "Then I have nothing more to say to you."

"Just don't stay there. We'll talk about it later."

"Later is *too late!*"

She cut the connection, and her image faded. Mikey was watching from the far side of the jello-tube. I met his eyes.

"I warned her," I said. "I can't tie her up and make her leave."

"Yep," he said.

"I feel like shit."

"That woman knows how to take care of herself. I don't think you got cause to worry."

I gave him a curious look. "You

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don't like her, do you?''

He pinched his lip, studying me, then shook his head. ''Nope, I sure don't.''

''You haven't seen her at her best. She's really—very—''

I stopped before his gaze.

''She helped me when I needed her,'' I finished, lamely.

''Yeah, and you been paying for it ever since.'' He shook his head. Then the hard expression went away. He gave me a smile.

''Go fix Golem. Time's a-wasting.''

PEOPLE WHO LIVE IN GLASS HOUSES

''Where is he now?'' Mikey said in my head.

I-Golem looked up through the trees; the ''WAPL News at 11'' collocopter's blades beat the air somewhere off to my-Golem's left.

I-Golem popped up a vidi menu and made a selection; a three-dimensional grid appeared before my-his vision. I did a triangulation on the sound of the collocopter props. Then, ''Got you. You're to my-his northeast, forty-two point two degrees. I-he am just off the estate maintenance road, nearing the tram at cliffside.''

To keep things less distracting for me, Mikey and I were communicating by radio through the linkware. I opened my eyes a crack—Mikey's profile in the pilot's couch beside me was lit up a zombie green from his readouts. The input was distracting, so I closed my eyes again. But in a part of my mind, even through the insulating earphones, the collocopter's blades beat at a different pitch than Golem's audio-receptors heard, and sticky, sweaty spots on the copilot couch pressed against the backs of my thighs and my neck and arms.

We'd discovered one of *Aïn el Baraka's* security measures the hard way: broad-band radio signal noise transmitted from radio towers at the cliff face. It made using Golem from a safe distance impossible, and even close up it interfered with the low-energy communications support, like the tracer signal we'd installed on Golem. And Mikey had already boosted the signal to its limit.

The good news was they hadn't detected our intrusion yet. We had ghosted right over the estate's perimeter radar towers in Mikey's stealthy bird, and Mikey had eavesdropped on their transmissions long enough to make sure they hadn't detected us before we dropped Golem off. Then I'd activated the linkware, downloaded my awareness into Golem, and headed for the cliff.

The 'copter passed overhead. With his IR, I-Golem glimpsed two figures behind the bird's darkened windows. I-he dropped forward onto his front set of wheels and rolled on all fours through the underbrush to the edge of a parking lot. At the building on the other side of the lot, beyond a large number of road and air vehicles, several robots or waldos were loading crates from a semi-van at the curbside into a tram car that waited at a platform at the edge of the cliff.

I-Golem reared and swiveled his new eye for a quick, monocular glance at *Aïn el Baraka*: a white smudge against the maroon and burnt umber of the twilight sky. The mansion seemed to float in midair a hundred feet or so from the cliff face. Light glared from a few dozen of the many windows on its face,

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and three stout cables of metal braid were slung between the mansion and the cliffside. On this side, the tram cables coiled about a huge, dull red spool which protruded from the building. The mechanism reminded me of an antique watchworks.

I did a quick scan on my-Golem's transceivers. The workers' conversation, not to my surprise, didn't broadcast on my-Golem's range of channels.

"Mikey," I transmitted, "see if you can pick up their transmission signals. Are they waldos or robots?"

"Ah. Clever. Give me a minute."

I-Golem dropped again and rolled along the edge of the parking lot at a good clip, keeping a screen of shrubbery and trees between me and the mechano-workers. They passed out of my-Golem's view behind the building. In a few moments, on the building's other side a horizontal metadiamond strut moved into view, stretching out into the twilight.

I-Golem rolled to a stop. The support strut was as thick as a five-hundred-year oak, and clear as ice—so clear I could see in it a miniature, inverted image of the muddy Hudson and the flickering lights on the forested hills of its far bank. The mansion was almost obscured by the tram building.

"Ruby, you copy?"

"Yeah—go ahead."

"I found the signal. We're in luck. They're bots, and they're controlled from a central, uncoded source. I've recorded the ID-imprints of all the units. You ready to go on-line ducky decoy?"

"Ducky decoy it is. Let me-Golem deactivate one of their bots before you switch Golem in, though. We don't want to foul up their tram loader program with one too many inputs."

I-Golem uncoiled his snake arm. It flicked like a real snake crossing sand—so graceful and powerful, so *eager*, somehow, that I wondered whether its programming might somehow be tainted with a killer instinct; whether it might take over and run amok. *Renegade Warrior Arm Wreaks Havoc at Famous Mansion; Five People Killed.*

I-Golem curled the arm up and fitted it with a hole drill and butterfly blades. Then I-he rolled up over the curb and back around to where the robots were loading crates. As one of the squat, rod-and-basket units passed me-Golem, I-he saw that the crate it carried contained fruit. Grapes and peaches and strawberries, by the bushel.

"Ready, Mikey?"

"Ready."

"Ducky decoy on my signal."

The snake arm lashed out, slammed into the robot's chassis and drilled through its casing. The robot's talons clacked and flailed wildly—a teeth-jarring burst of broadband radio static screamed in my head. Then Golem's butterfly blades made sparks and scrap metal of the robot's circuitry, and it went silent.

I transmitted to Mikey, "Now!" and used the schwarzenegger to wrench Golem's arm loose from the robot unit. Mikey downloaded the tram loading software and ID-imprint into Golem and activated it. Golem slid free of my control—I opened my eyes back in the 'copter.

That robot was only a machine. I had to tell myself that several times before I stopped feeling like a murderer.

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Behind my open eyes, I could half-see and -hear what Golem was seeing and hearing, as he picked up the crate and bumped over to the tram. He'd refurled the snake arm. Thank goodness. Superimposed over that sight, next to me, Mikey grinned, teeth lit up green. His eyes were hidden behind dark, convex specs filled with dim flickers; earphones covered his ears and a dark worm—his mike—snaked from the phones to his lip. He wore net gloves on both hands. Right now he was checking his readouts. After a moment his voice came, brass-on-rushing-water, through my earphones.

"Beautiful. Their control unit only registered a minor glitch before Golem took the bot's place. We're in."

I adjusted the mike against my jawline. "Great. Let's find someplace in the forest to put down and I'll go hide the bot before somebody finds it."

"I've got an even better idea." He had a scary grin. Sparks danced on the specs where his eyes should be. He pointed. "Looky down there. Those vehicles must belong to guests. Look at all those 'copters—and nobody in sight! We put down in the parking lot, turn the bird's blades off, and stay inside. Perfect place to hide."

"Think it'll work?"

"'Course it will! What do you say?"

I scanned the parking lot and the tram. He was right. We'd probably be a lot less conspicuous among other helicopters than in the woods. I gave him a nervous smile and a thumbs-up.

"Let me circle around," he said.

I pressed my forehead and hands against the cool glass. Outside, in the falling darkness, the tram and building lay a hundred feet or so below us and several hundred yards to the southeast. Beyond them, out over the river, the mansion rose up on ice shafts that extended from the river below and grew out of the basalt crags of the cliff.

Held aloft like an offering to God, the palace defied gravity and climate. Dark windowpanes slicked, black ice-like, across the spanse of frost-marble walls. Spiked bulbs of gold and slopes of ruddy clay tile capped the structure, as if cliff and meadow had been exposed by melting snow. Half-exposed patios, cul-de-sacs, and glass-covered walkways shed soft light. Spotlights at the building's corners hurled shafts of blue-white light at the sky, river, and land.

Massive, airy—a carving of marble, gold, air, and synthetic crystalline rock—it floated, blazing cold light, arrogant and impregnable. I stared at it and a shiver of fear wiggled right up my spine. I almost told Mikey to forget it, then and there.

Lights began to wink on around the parking lot. "We should set down before someone sees us," I said.

THE CROSSING, ONE

Beyond the tram's forward window, as the car neared the mansion, two men stood arguing in the unloading dock. The dock was set into an atrium of brass and polished rock: a high ceiling, half an acre of floor space, pillars and plant pots and statuary, all marble and ceramic and brass and slabs of basalt.

The men stood on a strip of carpet that abused several shades of red, which led to the far end of the atrium and from there folded its way up a broad marble staircase. It stopped before a mahogany

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door you could drive a truck through, which sported a mahogany lion's head with a brass ring in its mouth. Beyond the walls of tinted glass on either side of the door, humans and robots, each of various makes and sizes, moved about on a polished rock floor among more huge vases.

Two monstrous, impassive guards in envie suits stood at the door. They looked like the ones at the funeral.

When I told Mikey, he looked disturbed. "Ominous."

We were both thinking it: with all the perimeter electronic security to keep people out, why the need to post human guards outside the exit routes—unless you're trying to keep someone *in?*

With a shudder and a deep-throated thud, the tram car docked. The doors slid open and Golem, following radio instructions from the bot controller, picked up a crate of fresh fruit and debarked the tram car. My heart gave a wrench when Golem clattered onto the floor of the dock, but the men were too busy arguing to notice a mechanical being, even Golem.

The larger man looked like he was about to melt, in a traditional chef's white uniform with huge rorschach blots of sweat on the back and under the arms. He also wore a white, creased puff of a hat which made me choke on a guffaw, and a juice-stained, full-body apron over the uniform. His bulk and manner made him look more like a longshoreman than a master chef.

Looming over the smaller man, he shook his fists and said with a Brooklyn accent, "The guests have been waiting for over an hour for the compote! The fruits probably all spoiled in this heat. You've got your nerve, holding up my shipment."

"I, too, have been tasked with keeping the guests comfortable, sir," the smaller man replied. He was dressed formally, *au natureil,* a white mandex singlet under translucent black gauze. His hair was waxed into a shimmering white fractal shape—loops within loops within loops, and glowing paints in a similar pattern that curliqued over his face and disappeared beneath his singlet, reappearing along his arms and legs. All that glow paint—it made me itch just to look at him.

"The lady authorized the linens to take priority on the last two transports," he said with a dignified air. "You tied up the trams for three transports prior to that, and several guests wanted to freshen up—"

"Where is she? I want her to substantiate this."

"She took one of the yachts into Manhattan a half an hour ago."

"Oh?"

"I'm afraid so. You'll simply have to wait till she returns."

I returned to myself. Mikey and I exchanged a look.

"You copy that?"

"Yep. But it's only 10:40; we still got plenty of time. Get going—we'll get Golem in a side entrance and then I'll guide him to the guest wing."

Golem was heading toward the railing, where stacks of crates and boxes had been piled. I tuned back into him as he was putting the crate down.

"Mikey, disengage—now!"

Golem jerked but I slipped back into control and got myself-him moving again before the break in his program-

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ming showed much. With a backward monocular glance at the two men—who were still arguing—I-Golem rolled on past the tram and kept going along the outer walkway.

With twilight, the walkway had sunken into gloom, lit only by the occasional knob light set along the railing of waist-high, scrolled plaster posts. Golem-high stacks of folded, canvas-wrapped linens partially blocked the path of marbled basalt. That gave me an idea. I-he shook out the Tuffnet web and stuffed several packets of towels into it.

THE CRITIC'S CHOICE

Mikey said the maps were straightforward—"easier'n a stroll through the park"—and I did exactly what he told me: "Go through the second set of glass doors past the indoor patio, down the hall to the end, turn right, then take your first left, then go four doors down and take the fire stairs up to the third floor. . . . "

A pair of servant-type people passed me-Golem in the hall, and they gave me-him some pretty strange looks, but they didn't try to stop me-him or ask any tough questions. After that encounter ended uneventfully I let myself breathe. I even started to believe I was going to pull this un-salvage off.

Within a few minutes, though, despite the fact that Golem's mechanical presence didn't activate the house lighting system and the rooms and corridors were sunk in a sort of warm gloom, things were starting to look familiar.

"Mikey, we've got a problem."

"Yeah, what?"

"How to put this?—next time *I'll* do the map and *you* pilot the beast."

"I ain't got the equipment for it and you know it." Then, as what I said sank in, "You're not there yet?"

"Not even close. I'm in the art gallery."

"The—? You can't be! That's clear over in another section!"

I-Golem gave a nearby bronze bust a monocular once-over. "Well, Napoleon Bonaparte here begs to differ with you."

"You must not have been following my instructions."

"I did exactly what you said. I even repeated it back."

"I told you exactly what the map said."

While he was talking, distant voices and footfalls floated into Golem's audio receptors. I shushed Mikey. I-Golem popped a grid and swiveled, trying to triangulate, but the sound was bouncing and echoing around too many corners, through the catacomb of rooms. No lights came on, which meant whoever it was, was at least a couple of rooms away. The sound soon died away. I relaxed. A little.

"Umm, let's settle the blame later," I transmitted. "Right now we need to get me-Golem out of here."

"I don't know how well we can trust these maps," he said, "but I'll for sure try. What room is Golem in? Who's the artist?"

I-Golem dropped onto all four wheels and rolled through a doorway into the nearest room. It was hard to tell in the dimness, but it looked rather like an equipment room.

"That don't seem likely in the middle of the art gallery," Mikey said when I

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passed this observation along. I enhanced Golem's vision with IR and rolled over to get a closer look at the machinery. The surprise drew a sharp laugh from me, which threw me back to the 'copter.

"They're artwork!"

Mikey's eyebrows went up.

"John Simon, remember?" I said. "The junk critter artist. Too schick!"

I tuned back in to Golem, and I-he studied the Simon "animachines" up close, tried to read a couple of the plaques. I could feel myself grinning. They were all sizes, metals and wire and plastic and lights, from thumb-sized to larger-than-life, made from antique machinery. And most looked realistic but somehow *wrong:* jade, but in a funny, almost animal-like way.

The voices came back then, much closer, and lights flooded the corridor behind me-Golem. I charged Golem's wheels with power and surged around the room, scanning among the sculptures. No place to hide.

" . . . personally prefer the classics," a voice was saying. A voice I knew—one that sent several thousand volt-equivalents of adrenaline through my body. "So I haven't been here in a while. But it's one of Uncle Youhanna's most cherished collections."

And then Jehenna followed her words through the archway, and the lights came up. She was followed by Captain Sheila "I Can't Get Away from You Anywhere" Nanopoulos, good for another near-toxic dose of adrenaline.

Desperation inspired me. I locked Golem into an outlandish pose, full height, arms extended in various contortions, camera eyes askew—which, not coincidentally, gave me a full view of the room—and beat a mental retreat.

Mikey was pulling my hands away from my face. He had a toothpick between his lips and worry in his eyes. "You're about two shades paler than a white woman ought to be able to get."

"Holy cow," I said. It was all I could manage. I was trembling.

"I hear the voices. Who is it? Where's Golem?"

"I'll explain later." I made a fist of my resolve and plugged back in.

They were staring right at me-Golem.

"I don't know," Jehenna was saying. "I've never seen it before. I thought it moved."

"Must have been the lighting." A pause. "It doesn't have a plaque. Interesting. It looks familiar." Nanopoulos studied me-Golem, chin in hand, with a narrow, thoughtful look that drenched me in icy, sweaty dread. "I've seen this thing somewhere before."

"Oh? Where?"

I thought about having Golem take her and Jehenna out with the snake arm. Maybe I could still find Sidra before they could stop me-Golem. The only thing that stopped me was a fear I'd accidently kill her. That'd be good for a trip off the planet—the hard way.

Nanopoulos said, slowly, "The Guggenheim, maybe. Or was it the Met? I've been to both museums recently, but I can't remember now which one."

"Maybe it was just a similar piece."

"I can't imagine Simon doing two alike."

"This one is certainly unique." Jehenna peered at me-Golem with a rather dubious expression. She waved a hand at Golem's chassis. "It's certainly eye-

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catching, what he did with the rainbow coloring on the metal." A pause. "I can't decide if I like it."

"I do. This sculpture is quintessential Simon."

They studied me-Golem until I started to squirm in the copilot's seat.

"I wonder what the linens signify?" Jehenna asked.

"Maybe servitude."

"I'd sure hate to have a bot like that waiting on *me*. It would give me nightmares."

They both laughed and moved on to study a couple of the other sculptures. I took the opportunity to transmit a quick update to Mikey on who they were.

"Holy cow is right," he said.

Nanopoulos had changed the subject. " . . . attending the wake? Traditionally it's supposed to last three days, right?"

"That's right. Attendance is down from yesterday. We have about four hundred local people attending tonight's gathering. And about a hundred additional overnight guests, I think." After a pause she said, "We really appreciate all you've done, Captain."

"After all he did for my dad it was the least I could do." A pause. "It's hard to believe he's gone. When I was little I thought of him as immortal—he had such presence, such power to persuade."

"Yes. I keep thinking I hear his voice. I keep expecting to turn a corner and find him there."

"Rachel seems to be taking it hard."

Jehenna nodded. "She lost him so suddenly."

"This sort of thing never seems fair to me. He was in excellent health. If only that salvage woman had come along sooner maybe he'd still be alive. Or if he'd postponed his trip. What was he doing out in a hypercat right before a hurricane, anyway?"

"I guess we'll never know," Jehenna said.

Mikey snorted. My sentiments, exactly.

Nanopoulos asked Jehenna, "Where is Rachel now?"

"Resting, I think."

"Good. I'm sure she needs it."

A series of high-pitched, staccato beeps issued from somewhere in the vicinity of Jehenna. She pulled a kelly out of her pocket, and when she activated it a hologram appeared in her hand—an Egyptian-looking man in a security uniform. A glint of silver on his crown told me he was a beanhead.

"We've found a bot destroyed at the tram house, cliffside," he said. "Someone must have penetrated the maintenance software and substituted a waldo for the destroyed unit. They probably came across with a load and are in the house now."

"Shit," I said. I opened my eyes and looked over at Mikey.

"For crying out loud," he said. "We're screwed."

I touched my lips for silence and retuned to Golem.

Nanopoulos had said something I'd missed. Jehenna looked irritated. "News media, most likely. We had trouble with them yesterday."

"I can summon a couple of squad units."

"No. I don't want to disrupt the wake and we have plenty of internal security. Ahmed, have housekeeping switch over

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to hard wiring on all the bots and waldos, notify the guests that radio communications are going to be hampered, and then drop a white noise sheet over the house. That should disrupt their transmissions long enough for us to find the intruder. Focus the search in guest and party areas. They're probably looking for unauthorized footage of the wake.

"There must be a signal booster on the estate—maybe they bribed one of the guests to drop it on the grounds somewhere like yesterday. Radar hasn't detected anything bigger than an owl all evening, and they couldn't be getting through the perimeter security with an unboosted signal."

The frown on Jehenna's face deepened. "If that's so, you people in security haven't been doing your job. All guests were to be screened electronically before entering the grounds."

"I'll find out who or what was responsible for the error."

"Do that."

"Do you want me to use Tiny Tim, as well?"

"No. Leave him in storage for now. Give me regular updates on your progress."

I could feel Mikey's gaze on me, and returned to the 'copter. He flicked his chewed-up toothpick over his shoulder. I gave him a look. You know—a *look*. "You heard?"

"I heard," he said.

"We've maybe got half an hour."

"Huh."

"So what do you think?"

"Huh." His brow piled into a stack of m's. He reached into his flight jacket, pulled out a small gold case, extracted a new toothpick, and stuck it between his teeth. Then he skull-grinned me.

"I think you'd better make it snappy," he said.

ROOM SERVICE, ONE

Knock knock.

"Who is it?"

"Room service, ma'am. May I offer fresh towels?"

The door slid open, and beyond it a woman walked, bare buttocks receding, toward the bathroom—a towel-draped hand rubbing a mess of wet hair with alarming vigor. She waved a vague hand toward the mattress piled high with tangled sheets in the alcove.

"Throw them on the bed, would you?"

A multi-level heat, light, and sound scan. No Sidra.

ROOM SERVICE, TWO

Knock knock.

A pause. No answer.

Knock knock.

Still no answer.

KNOCK KNOCK.

Still no answer.

I-Golem stood a long moment, scanning for sounds at the door. No sound inside; no Sidra.

ROOM SERVICE, THREE

See Room Service, Two.

ROOM SERVICE, FOUR

See Room Service, Three.

ROOM SERVICE, FIVE

Knock knock.

Beyond the flying-open door stood a large man with a totally bald head

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shaped like a ballistic missile. The glower melted to a look of alarm or perhaps disbelief when his gaze focused on me-Golem, and curdled into a half-perplexed, half-angry frown.

The upper half of an anorexic woman appeared from behind him, holding her hair with one hand, teeth and fingers of the other hand prying apart the jaws of a clip. The hair cascaded out, waterfall-like, mostly from a central point, and lit up in a shifting array of colors like backlit fiber-optic cables. Her diaphanous gown, briefly glimpsed, flashed phosphorescent fireworks in tandem with her hair.

A muffled shriek issued from her when she saw me-Golem—mouth and eyes flew open—the clip tumbled to the ivory-colored carpeting.

"What is *that?*"

"No cause for alarm, ma'am, sir. Housekeeping service."

"They finally brought the bedclothes. It's about damn time. They didn't even give us a balcony room, and now this."

"Please don't use curse words, Frank."

"I don't care. It's been over an hour. Hurry up about it. What are you doing? I don't believe this. You moronic machine! We didn't order towels. We need sheets. Damned idiot. Go back and get *sheets*. King-sized sheets. And pillowcases. You get me?"

"Yes, sir. King-sized sheets and pillowcases. I shall return *post haste*, sir."

"Please don't curse, Frank."

"I don't care, damn it. Fool machine." From beyond the shutting door: "What have you done to your *hair?*"

ROOM SERVICE, SIX

See Room Service, Four.

ROOM SERVICE, SEVEN

Knock knock.

After a pause, a man's voice: "Who's there?"

"Room service."

"I didn't call room service."

Knock knock.

"Who's there?"

"Room service, sir. Fresh towels."

"I said I don't want room service. Beat it."

Knock knock.

Another pause. The door slid open and a young man wearing a scowl and a Japanese-style robe stood on the other side. A white man. His erection, which made the cloth poke out, was slowly deflating. A swift multi-level scan of the room revealed a young woman in the bed with sheets pulled up to her chin. No Sidra.

"Sorry, sir. Wrong room."

His face contorted. "You—" he sputtered, and slammed the door.

ROOM SERVICE, EIGHT

Knock knock.

"Who's there?"

"Room service, sir. Fresh towels."

"Fresh towels? That would be just the thing." A pause. "Your voice sounds mechanical."

"I'm a robot, sir. Housekeeping bot. Fresh towels?"

"Yes, thanks; bring them right in."

I-Golem stared at the closed door for a minute, and I could feel myself frowning.

"What is it?" Mikey transmitted.

"Strange. Hang on."

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"Sir," I-Golem said, "the door is closed. My programming requires the door to open before I enter."

"Ah. That is a problem." The man's voice sounded strained, artificially cheerful. "You see, I think the door is jammed. Er, do you have the equipment to open it?"

My heart started to flutter in my chest like a trapped bird. "This is it," I told Mikey. "I recognize his voice. They've locked him in from the outside."

"I believe I have the right equipment," I-Golem said. "Step back, please."

I-he extended his schwarzenegger arm, gripped the door handle, tightened the grasp till the handle dented, locked his wheels and *pulled*.

Nothing happened for a second. Then, with a grinding scream and a snap, the lock mechanism broke and the door slid open.

Sidra stood on the far side, looking the way I remembered him—rather tall and lean and athletic-looking, like a runner, with black skin and a shaven head, prominent cheekbones, a reticent chin, aquiline nose, and hazel eyes hollowed and darkened. He wore his red and yellow novitiate robes, belted with cloth at the waist, and sandals.

Sidra looked from me-Golem to the shorn handle in Golem's hand, and surprise crossed his face. Then he stuck his head out the door and looked both ways. He passed me-Golem and started down the corridor.

"Ack," I said.

"It's him," I transmitted, executing a hurried K-turn.

"Sidra?" Mikey's voice sounded incredulous.

"Wait," I-Golem called, speeding after Sidra. "Wait!"

Over his shoulder he threw me a look of dismay. "I don't need towels. I've changed my mind. Go away."

At an intersection with another corridor he slammed into a man carrying luggage. They both stumbled back.

"Excuse me," he gasped, "may I borrow your kelly?"

The man shook his head, opened his mouth.

"A netphone?" Sidra rushed on.

The man shook his head again and squeezed out a "Sorry, I—" but by that time Sidra was gone.

Both the man and the woman beside him moved back against the wall as I-Golem sped past them, gearing down for the corner, mechanisms grinding. Two children—a girl about ten and a boy about five—came around the corner, blocking my-Golem's way. I-he screeched to a halt, nearly tipped over.

A look of delight burst onto the girl's face. "Freaking wonky. Daddy, I want one!"

The boy took one look at me-Golem and started to scream.

"Wait!" I-Golem dodged around the kids as Sidra disappeared into a stairwell down the hall.

TRACKING SIDRA

I-Golem looked down the stairwell, and then up. I-he strained his audioreceptors. Faint echoes above; ditto below.

"They've got the house systems tied up," I transmitted. "That's why he's looking to borrow someone's personal comm system. Maybe he's trying to call the police."

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"And report his stepmother for kidnapping? Come on."

"Yeah, well," I started, but he interrupted, sarcastic.

"Yeah well, what? Who'd believe him? He's some disinherited crackpot from a mother-earth activist cult, and this Karam woman is now one of the wealthiest women in the western hemisphere."

"It's not right."

"No, but it's life. I bet he's trying to get hold of his cult buddies, tell them what's happened, get help that way. Them cultists, they don't trust the police any more than you do, chica. They don't trust nobody but themselves."

That pissed me off, but I didn't say anything because he was right.

"Looky here—I'll give you odds he's simply trying to get out. And there are only two places he can go to get away. Either the tram or the glass elevator."

"You can see the tram," I transmitted, "so we have one route covered. I guess that means I-Golem'll cover the elevator. But he could get on at any floor and be down to the river in no time. How'm I going to know?"

"It ain't necessarily gonna be that easy for him."

"What are you talking about? I've passed at least four elevators."

"That glass elevator that goes down to the river docks ain't connected to the internal house transport system. There's only two entries."

"Oh yeah?"

"Yeah. I'm looking at the map right now. There's an entry at the inner atrium in the back of the house, behind the hanging gardens, and the same location down in back of the recreation center."

"So he'd have to get on the glass elevator in the first floor atrium or at the bottom of the hanging gardens behind the rec area," I said. "I'll give you odds they have both entrances to the river elevator under watch, just like they do the tram."

"Seems likely. Now, there is a chance he could have gone up the stairwell instead of down. Do you think he's got any reason to go up? Like to the roof?"

"Nope."

"That's what I figure, too. According to my map the stairwell you're in goes straight down to the pool. So," he said, "I'll give you double odds he took the stairs down to the rec area and is trying to figure out how to get past the guards they have posted there."

I-Golem tipped back and started bumping down the steps, clinging to the rails with the finger-hander and the telescoper. "I sure hope so. Whiteout's coming; we can't afford to be wrong."

SIDRA EXPERIENCES DISBELIEF

Mikey's hunch was good. Sidra stood behind a planter filled with chrysanthemums and marigolds, his back to me-Golem, straining to see past the plants. A clot of children ran past behind him, shouting. Sidra jumped, alarmed.

On the other side of the planter, water gurgled in the jacuzzi, in which several nude adults sat, sniffing and laughing and rubbing at their eyes from what must have been a sinus-searing dose of chlorine. And from where I-Golem stood, looking through the glass stairwell door, a woman dressed in the

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house security uniform was visible standing, arms folded, next to the bar.

The planter where Sidra hid lined a walkway set in glazed porcelain that curved around past the pool and the badminton court. The pool was filled with rafts of candles set amid lilies, white roses and pale, spotted orchids. Beyond the mesh that surrounded the badminton court, behind a glass wall, were woven rafters of tropical greenery and lush flowers—the hanging gardens. Beyond *that* should be the elevator to the river, if memory served me. Throughout the rec area, metadiamond struts supported the mass of the mansion overhead and played with the light of the torches set around the pool.

Robotic servers and maîtres d'hôtel carried trays of food and drink and wandered among the few guests lounging in the poolside chaises or standing at the bar. An oversized acoustic guitar skated on its stilts from group to group, tickling its wire-strung belly with spidery hands. Classical music spilled out from beneath its fingers.

"Not as many people as I expected," I transmitted.

"I bet there's more inside where it's cooler," Mikey said.

I-Golem used his zoom and saw that the servers and maîtres d' all had cords leading from their backs to a grid of nearly invisible wires that ran overhead. Perhaps twenty minutes had passed since Jehenna had ordered the white noise sheet.

Whiteout, any minute now. I had a sudden urge to bolt.

Footsteps hit the stairs behind me-Golem. I-he rolled out of the stairwell and held the door for a nude young man followed by a nearly nude woman. Sidra heard them and moved forward, grabbing the woman's arm. His voice was urgent and low.

"May I borrow your kelly?"

She smiled apologetically, motioned at herself. She was dressed only in a gauze wrap, clearly without pockets.

"Haven't got it with me. Sorry."

Sidra's fist punched the air in a motion of frustration—then he spun with a muffled yell when I-Golem tapped him. Dismay settled onto his face again when he recognized me-him.

"Look. Go away. *Stop following me.*"

I lowered Golem's speaker volume and dropped to all four wheels. "Sidra Nasser, I'm not a robot. My name is Ruby and this is my waldo Golem. I'm here to deliver a message from your father."

His face went slack with shock. "What?"

"Can we talk someplace more private?" I-Golem asked, as yet another person strolled past. "It's important and we don't have much time."

"What sort of sick joke is this? My father is dead. Who are you?"

"I told you. I'm Ruby. Ruby Kubick. And I know your father's dead. I was there when he died."

Sudden recognition pushed the skepticism off his face.

"Ruby Kubick," he repeated. "The woman who . . . " His voice tapered away and he swallowed. "He . . . he gave you a message for me?"

"Well, sort of. Look, there has to be a better place to discuss this."

He studied me-Golem, then drew a breath. "Follow me."

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Sidra led me-Golem through a corridor, around to one of the outer walkways that faced the cliffs.

"Lights down," he commanded, and as the globes dimmed he turned to face me-Golem again. His face was shadowed. By this time I-Golem had keyed open the secret compartment. I-he pulled out the gelpaper envelope and extended it.

"Your father was on his way to have this delivered to you when his hypercat capsized," I-Golem said.

Sidra took the envelope, read his name on the front, frowned. He pulled out the note and the will. His face didn't change expression as he read the note. Then he looked up at me-Golem.

"He didn't reinherit me. I was there for the reading."

"They read the wrong will. The old one."

He looked at the note, turned it over, examined the smaller, ribboned envelope with the Arabic writing on it. Then he looked up at me-Golem again. His hands were trembling and the same dreadful look came onto his face that had appeared at the funeral.

"I don't know who you are or what you think you're doing with *this*," giving the note a shake, "but I'll bet I can guess."

"I'll bet you can't."

"Oh, I think I can. I'll bet you think you're the first person to come up with the idea of taking advantage of my relationship with my father, and you've come up with this great scam to take me for all I'm worth, or to get to his fortune through me.

"Well, whoever you are hiding behind that machine, I have news for you. I've seen it all. You have no idea how many times. And I'll bet you think you're safe hiding behind that machine, but if I ever find out who you really are—"

"Whoa," I-Golem said, "wait! You've got it wrong. Listen to me. This is real."

"I'll take that chance." He hurled the two envelopes and note at me-Golem and stalked off.

The envelopes struck Golem's chassis—I-he grabbed at them. The Coptic cross and chain slithered out of the gelpaper envelope and struck the pavement. The note fluttered away, caught by the breeze, and the diamonds went skittering across the stones, hurling light flecks. By the time I-Golem had collected the items and stuffed them back into the gelpaper envelope, Sidra was long gone.

"Hoo-ee," Mikey said in my head. "Got himself an attitude."

I-Golem headed back toward the pool, feeling half angry and half freaked, making my head spin. I couldn't think too clearly.

Mikey said, "I say blow it off. It ain't your problem if he turned down his inheritance."

"Guess he gets a lot of assholes bothering him or something."

"Forget about him! They're gonna drop the noise sheet any minute."

Mikey was right. No matter what Sidra's reasons were, I wasn't about to sacrifice Golem for another chance to argue with him about it.

"Yeah. You're right."

"Send Golem down the river elevator. Even if they got guards there, nobody's going to stop Golem. They'll

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think it's part of his programming."

"OK. You're right."

"And stop worrying, Ruby. You done all you could do."

"I wonder if he made it out," I said.

"Probably not. Security's too tight."

After a second, when I didn't say anything, Mikey added, "He'll be all right. He's not breaking any laws and they can't keep him locked up forever. But if you don't get Golem's big tin-can ass out of there, they're going to find him and haul you to jail for trespassing. Or worse."

I-Golem locked the envelope away again—if I lost Golem to a whiteout, I didn't want the envelope in plain sight—and then rolled along past the partiers at the pool, past the badminton court. I-Golem went through a set of climate-lock glass doors and entered the hanging gardens.

Beside me-Golem was an ebony and brass railing, and the floor on the other side of the railing was made of glass. A sign made of pale pink neon set into the ebony said *DANGER! Do Not Climb Over Railing or Step on Metaglass!* Beneath the metaglass floor, the lighted glass elevator shaft rose through the darkness from the lighted boat dock at the river's edge far below.

I-Golem rolled over to the railing and looked up. Lit by bars and globes, a forest of leaves, runners, ferns, rafters, and vines hung suspended—great baskets and twined branches in thatched nets and platforms—emerald, African blue-greens, dark and light and gold and cool greens. Splashes and cascades of flowers weaving through in red, lavender, white, butter-gold, pink, and blue. The support struts, crystalline tree trunks, rose among them and along the sides.

The hanging plants were spread just evenly enough, kept trimmed just so, that they cast green shadows all the way from the metaglass ceiling, beyond which stars were visible nine floors up. Birds chirped and leaves twitched overhead in engineered breezes. I wondered if those were real birds, and if so, how they kept the bird shit off the glass floor and the balconies.

On this floor and the floor above, a walkway surrounded the garden on all sides. Higher up, semi-circular balconies surrounded the garden on all but one side. That side was a sheer, eight-story wall of metaglass.

I was far enough back to see, unobstructed by the first floor balcony, the starlit night sky through the leaves and the metaglass wall. To the west, a waxing moon hung over the dark hills. Sheet lightning ionized the sky in the south. The beauty of the gardens and the glass and the night beyond caught me so by surprise that it froze my breath in my chest, made my nose sting and my eyes tear.

There are a lot of things I've been missing, I realized, and wished suddenly I could stand in that garden myself. I wanted to smell the plants and dirt and flowers, touch the hand rail, pick up a leaf, instead of seeing it all at a remove.

Mikey coughed. The air in my nostrils was hot and close, smelling of sweat-heated vinyl, and old leather: Mikey's Army flight jacket.

"What's happening?" he transmitted.

I forced myself to concentrate.

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"Storm's moving in."

"Tell me about it." He sounded tense.

I-Golem rolled around toward the elevator. A small tiled vestibule lay before me-him, and there was the river elevator entry, in brass, glass, ebony, and black enamel. No elevator car was inside. To either side of the elevator was metaglass, and beyond, the hills.

Two beefnecks stood in front of the elevator, blocking Sidra's way.

"Just what the hell is going on here?" Sidra demanded. "Who told you to restrict my passage?"

"I'm sorry, sir, but you'll have to wait to speak to Ms. Karam," one of them said. Sidra looked at the guard, opened his mouth, closed it. Then he tried to shove past the guard and push the elevator button.

The guard grabbed his arm, twisted it behind him, and pinned him against the elevator shaft wall. Sidra, cheek pressed to the chrome, bucked and struggled; then the guard said something in his ear that made him go still.

"Aw, shit," I said. Mikey said something but I didn't hear it. I-Golem reared onto his hind wheels, whipped out all his arms and moved forward: an eight-foot, 1,000-pound mechanical monster with nasty-looking appendages bristling like something out of a surgical nightmare.

"Let him go," I-Golem boomed at his highest volume. The guards spun, gaped at me-Golem. The one holding Sidra yanked him aside; the other pulled out a gun.

"Not that—you'll draw the guests," the one holding Sidra snapped. "Call Ahmed."

They backed along the walkway, one guard holding Sidra in a half-nelson, who was kicking and twisting in grim silence, the other pointing the gun at me-Golem and whispering into his kelly.

"Help!" I-Golem yelled at the top of his voice, waving his arms. "Fire! Murder! Rape! Help, someone! Come quick!"

Sidra twisted far enough to knee his guard in the balls. The man doubled over with a grunt—Sidra double-fisted him in the face and he went over backwards in an arc. For a priest, he was mean with a punch. Sidra ran toward me-Golem and the other guard.

Footsteps slapped the pavement behind me-Golem, nearing. I-he rushed the man with the gun—ignoring the slug that ricocheted off Golem's chassis—whipped out the snake arm, and hugged the guard, lifting him off his feet. With the schwarzenegger, I-he took the gun away. The guard's face started to turn red; maybe I-Golem was squeezing too hard.

I-Golem dropped him and handed the gun to the first guest who came running up. Sidra passed me. Several people were rushing up behind; others peered over the railings from the balconies overhead.

"Don't let them get away," I-Golem boomed. The guest with the gun winced, and I lowered the volume. "They're criminals."

He pointed the gun uncertainly at the two security guards. "Aren't these men house security?" he asked.

"What's going on?" someone asked. Other voices rose.

"You're in a lot of trouble," the man

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I-Golem had hugged said. "I'm going to sue. You broke a rib."

"Then you'd better sit still," I-Golem advised, "or you'll pierce a lung."

Sidra went up to the guest with the gun. "Give me your kelly. Hurry."

The guest dug into a pocket with his free hand, pulled out a hand-sized kelly. Sidra snatched it from the man's hand, typed in a number. After a pause, a hologram of a Forest Veils priest appeared in the palm of Sidra's hand.

"Would someone like to tell me what's going on?" the guest with the gun asked.

"It's kind of a long story," I-Golem told him.

"Cousin Nasser!" the hologrammatic priest said. "When we heard nothing more we began to grow concerned."

"With good reason. They've been holding me against my will—"

But the hologram had already turned to milk, as signal noise rose to a gravel avalanche in my head and Sidra shouted, "No!"

"Lock down, Ruby!" Mikey was shouting in my ear. He was shaking me by the arm. "Lock Golem down!"

I transmitted the locking command, but couldn't tell if Golem got the signal in time. Everything whited out.

A PARTING OF WAYS, TAKE ONE

I came to in the 'copter, one hand holding the disengaged beanlink connector wires and the other on the door handle. Mikey had both hands on my right wrist and hand, trying to pry my fingers loose from the handle.

"Easy," he said, holding me down. "Easy."

I fought him. "Golem's in there!"

"You gotta wait. Security's all over."

He was right. Outside the smoked window, beyond the other 'copters, cars, and buses in the mercury-lighted parking lot, a group of envie-suited figures were milling around. Security.

I went cold and started to shake—stopped fighting Mikey's hold. I'd nearly burst out into their waiting arms.

Mikey saw my expression and let me go. He had binocs around his neck now and had removed the net gloves. His lip and forehead were collecting beads of water. He gave my arm a squeeze. He really stunk—serious BO. Or maybe it was me.

"They been there a while. They're searching the woods for electronics. I turned off the engine so they wouldn't hear it running and come investigate."

The temp was probably not much hotter than 110°F, and the humidity had dropped—uncomfortable but not deadly. A gust of wind made the 'copter shudder, and lightning traced the sky to the south.

I took some deep breaths to calm myself and sat forward, unpeeling my back from the seat with a velcro noise. My fingers trailed over my dripping hair, the warm metal jack at my crown.

"Eventually they're going to do the parking lot," I said.

"They've found their intruder. There's no need."

Even as he spoke, the suited figures were beginning to gather at the tram. Others came out from the woods.

I felt sick. I covered my face. "Shit."

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"Ruby." Mikey took my hands. "Golem's a goner and so's the will and the diamonds. A storm's coming in. We gotta get out of here. You gave it your best shot. Comes a time to cut the losses and let go."

"No." I started shaking my head. "No."

"Ruby—"

"I can't stop now. I won't leave Golem in there. I'm not giving up."

"It's a machine, damn it. A machine!"

"No!"

I threw off my belt straps, scrambled into the back seat, grabbed my linkware beanie.

The engines started up. I turned. Mikey's jaw had set.

"We're taking off, chica," he said. "Sit down."

I showed him the beanie. "This'll work if I can get close enough. I'm going in."

I shoved open the door that faced away from the tram building, fell out, and slammed it shut. The guards had seen the blades start up and one or two were coming toward it, breaking into a run. I dove for cover beneath a collolimousine at the edge of the parking lot—barked my forearm, got a face full of grime, and took dirt up the nose.

"*Damn* you, Ruby!" Mikey said in my ear. I'd left the earphones and mike on. The blades were beating faster. I spat dirt out, wiped my mouth.

"Go!" I said. "Watch the roof. Wait across the river."

One of the guards was almost to the 'copter.

"On the roof, then. Damn fool."

The 'copter lurched into the air and shrank upward toward the gathering storm clouds.

Staying low, I scrambled into the woods and made my way around to the far south side of the building, away from the security guards. The wind, potent with the smells of mildew, leaves, and wood turpentine, fought me. My eyes teared. When I reached the building wall, the security people had gathered in a knot near the tram, talking. The wind carried the individual words away.

The riverward side of the building was well-lit; I crouched in the shadow at its southern edge, near the horizontal support strut. The strut came out a good eight or ten meters below the edge of the cliff. In the dimness I could make out a short, rocky slope down to the cliff's edge.

The tram building's face was bare and flooded with lights. There was no way to get to the roof of the building, to climb onto the tram car roof, without being seen. So I decided to go across on the support strut.

THE CROSSING, TWO

The leather sandals were no good for climbing but they were all I had. I tied the layers of my gauze clothing in knots at the elbows, waist, and ankles. The beanie I put on, and deactivated it to shut out the brain-shredding white noise. The headphone-mike set I tucked into my belt.

I left the shadows, sprinted for the cliff, and slid down the hill on a slide of rocks, praying no one would look my way during those few seconds. The wind hid the sound of rocks tumbling that my heels and buttocks loosened. I

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threw my weight flat and slowed the slide, digging my hands and heels in. At the cliff edge I looked down.

It wasn't quite as bad as I'd feared; there were outcroppings and ridges I could use, and, as my eyes became adjusted, with the light from the house and the moonlight there was enough to see by. I rolled over onto my belly, scooted over the edge, and clung to grass while my toes sought the first rock. Found it—and I was over the side.

Crouch, Drop. Scoot. Grasp, dig, slip, grab, grope, drop, cling. I looked down, panting, and the strut was just below. I was covered in scrapes and bruises. It cuts down on wear and tear in a big way, using a waldo for this sort of thing. And besides, Golem fixes up a lot easier than I do.

One last scoot and drop and my heel struck the strut. I crouched, hands on the cool, curved glass for balance. The house was a hundred feet away. And the river almost five hundred down. Given my druthers, I preferred the house. I turned, stood, put my arms out, and started to walk.

The first few steps were surprisingly easy. Then a gust of wind hit me—the leather of my sandal slipped across the glass. I cartwheeled my arms, went to my knees, hard, and tightened all my muscles to steady myself. Then I spent a few seconds trembling and trying not to throw up.

After that, I crept along on my knees. It was a long crawl and my knees kept slipping and banging on the low-friction surface; by the end of it the nerve endings in my knees and palms were screaming.

The strut entered the structure about a story below the rec area. There was only one way up: stout cables of wire braid fanned out and up from a piton in the strut to various locations along the wall, just beneath the rec area wall. The shortest of them was maybe five meters long.

I rested for a minute, sitting with my legs wrapped around the piton, and then tested the wire. Not a bit slippery, and the braiding gave it a good grip.

I stood. I was so scared my body felt like all the blood had drained away. I looked down between my feet and then up at the house.

"Here goes," I told myself. "I'm not ready to die yet, so don't fall."

Then I got a good hold, wrapped my legs around the cable, and started to shimmy backwards up the wire using hands and feet.

It really wasn't all that far and the slope wasn't too steep. By hanging my head back and looking upside down I could see my destination: a row of decorative marble braces shaped like numeral 6s jutted out along the wall beneath the balcony, with winged angel busts on top of them. As I shimmied close, I let go with my legs, turned around so I dangled facing the house, and swung my legs out and up to catch hold of the lower curve of one such brace with my feet. Then I reached up with a hand and grabbed hold of the marble angel.

I nearly slipped and fell, but got an arm wedged between the angel's wing and its neck. With a last burst of adrenaline liberally mixed with sheer panic, I pulled myself up onto the brace, scrambled over the top of the carving, and got up over the wall. I landed on the slate

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walkway—and the lights came up.

With my wrap and baggy pants in filthy tatters from the climb, the last thing I needed was to be seen. Of course, all anyone had to do was walk past, and they'd collapse from anoxia. I *really* stunk.

I ordered the lights dimmed and bent over and practiced my breathing till my vision cleared and the nausea ebbed. Then I straightened, untied the knots from my ruined clothes, and looked around. I stood near where Sidra had thrown the envelope in my-Golem's face. At a run, I headed around the south end of the walkway toward the pool.

At the corner where the basalt tiles met porcelain, I stopped. Only five or six guests were left at the pool, three of them in the jacuzzi and a couple of others kicking their feet in the water at the pool's edge, making the candle-and-flower rafts bob up and down. Beyond, I caught a glimpse of Golem and some people inside the gardens.

I sat down cross-legged on the basalt and turned on the beanie linkware. The programming dampened the signal noise to a bearable level—and I downloaded into Golem.

Visuals were low-res and snowy, but steady. I-he was still at the elevator; a woman and three men, all house security, were heaving and shoving at me-Golem, their heads bobbing around at a level even with the top of his chassis. So—the lock command had reached him after all.

Jehenna and Captain Nanopoulos were there. Sidra was nowhere to be seen. Neither were the two security guards who'd tried to stop him.

Nanopoulos watched them try to move me-Golem. She said something over her shoulder to Jehenna, seeming puzzled. Jehenna looked angry and scared. She kept shooting looks at Nanopoulos behind her back. I-Golem inched away from their conversation, by the will of four heaving, grunting, and cursing people. I couldn't make out words among all the signal noise, except for an occasional swear word. I popped a programming screen and tweaked the radio transmission band up and down a microscale, trying to improve Golem's reception.

"This thing weighs a ton," someone said finally, through a steady avalanche of gravel on tin.

Half a ton, actually. I resisted saying it, of course. I canceled the screen and focussed Golem's hearing on the Captain and Jehenna.

" . . . appreciate the offer," Jehenna said, "but it's unnecessary."

" . . . just . . . can't make sense of . . . doing . . . crazy like this."

"She's a low-life . . . trying to . . . advantage."

A low-life, huh?

"What about the other man?" someone standing close to me-Golem asked. "The one who ran toward the pool?"

The man who spoke was the guest I-Golem had handed the gun to.

Jehenna shrugged. " . . . accomplice. Listen, Captain . . . we can handle . . . Aunt Rachel . . . situation under control. No real harm . . . I doubt . . . press charges. . . . "

Nanopoulos was still frowning. Then she sighed. "Very well . . . good-byes and get going . . . Call the local precinct . . . statement." She paused.

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". . . circumstances, perhaps . . . cancel . . . the wake."

Jehenna looked shocked. Her voice carried over the line noise. "That would be unheard of! Aunt Rachel would never think of such a thing!"

They shoved me-Golem up against the outer railing by the elevator. By this time Nanopoulos was walking away.

"When . . . communications problem . . . ?" An Oriental woman asked. Several other guests gathered there nodded and made noises. " . . . can't be out of . . . with the office . . . "

"It'll take a few hours to complete our media sweep," Jehenna replied in a raised voice. A groan went up. She added with a soothing gesture, palms down, "I'll make a general announcement upstairs in the first floor atrium, if you'll all join me up there in a moment. We'll make arrangements for everyone to have access to a house phone.

"You don't want pictures and videos of all your actions here appearing on the nets, do you? Please bear with us while we ensure your privacy and safety."

While the guests dispersed, one of the guards pointed at me-Golem and asked a question I-he couldn't hear over the line noise. I popped the screen and tweaked the reception again.

" . . . and disassemble it later," Jehenna was saying. She tossed one of the guards a set of keys. " . . . elevator down and . . . locked at the docks . . . Aunt Rachel arrives."

The guard caught the keys, salaamed, and pressed the elevator button.

"Where's Ahmed?" she asked the others.

" . . . Tim . . . " one of the guards said. "Looking for him."

Him had to be Sidra. So he'd gotten away and was in hiding somewhere. That was something, at least.

The bad reception was maddening and I had learned what I needed to know, so I disengaged and pried the beanie off my beanjack. I found that I had collapsed on my side and drooled on the tile.

A faint memory led me to a locker room along the walkway by the stairwell, which I managed to duck into without being noticed. I took an ultra-hot shower, shampooed and soaped down real good, trying not to enjoy the rare luxury too much—without a great deal of success.

When I stepped out of the shower, a full-length mirror on the bathroom door showed me to myself. Maybe it was the climb I'd just pulled off, maybe standing up to Melissa, or maybe it was a whole lot of things. But I looked different to my eyes. Better. A little too thin, maybe, and my tits weren't much, but even all bruised and scratched like I was I looked much better than I was used to giving myself credit for.

A smile spread across my image's face. I ran my hands over my body and then hugged myself. You're OK, Ruby, I thought. You look good.

I put on a terry cloth robe from one of the hooks. With the headset tucked inside, I tied the belt nice and snug. Then I ditched my gauze tatters in the trash cycler.

Lotions! On the wash basin counter. I hadn't noticed them, going in. And not the bargain basement stuff that comes in plastic gallon jugs, either: the impossibly expensive stuff that appears in ghost hands of gorgeous models in the jello-

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tube. With piles of soft cotton pads and cloths for application and removal. And cremes and powder puffs, perfumes, and cosmetics. All in etched crystal bottles and glass bowls glossed with metal oxides, lined up on the basalt-topped dressing table in front of a mirror whose surface was gilt with gold. And paints and kohls for the eyes and face in miniature vials of cut glass—and sparkle dust, and chime skin.

I sat down on one of the velvet-cushioned saddle stools, picked up bottles, sniffed and dabbed, smudged streaks of shimmer creme colors on the backs of my hands, and on my arms and thighs to hide all the scrapes and bruises I'd gotten on the way over. I rubbed cremes onto my eyelids and face, carefully hiding a gouge on my cheekbone. I dipped a finger in the chime skin, and snapped my fingers. Tiny bells whispered, far away—a sigh of high, clear notes.

Once done, I scrutinized myself. Much better. And well disguised, in case I ran into someone who knew my face, like Rachel or Captain Nanopoulos. I put the beanie back on and turned off the Golem-input, for the moment. With expensive cremes sparkling and chiming on my face, arms, and thighs, and my head turbanned in a towel, I was just another jacuzzi-soaked house guest.

Moxy, Ruby. Avoid Nanopoulos and remember your moxy. I strolled out of the locker room with a smile and a nod at the woman heading in. She smiled and nodded back. So far, so good.

A pair of male guards had stationed themselves in the pool area, eyeing the nude bodies. I entered the pool area and, heart banging so loud I was sure they could hear it, reclined in a chaise longue by the pool. A server gave me a flute of champagne with a strawberry floating in it, buoyed up by bubbles.

Champagne—and a strawberry. A real strawberry. This was as close as I was ever going to get.

I took a mouthful of the champagne; it was sour and effervesced like Alka-Seltzer. Cool fire burned my sinuses going down. I suppressed a cough. The second mouthful went down more smoothly. The taste clung to my tongue, in a way I decided I liked.

Then I dug the strawberry out with my fingers. It was real, a real strawberry. My mother had told me about them. I ate it in tiny bites, lingering over it, remembering my mother and what she said things used to be like and feeling sad. The fruit was sweet and delicious; I licked red, pulpy juice from my fingers and then took a last swallow of champagne. Reluctantly, I put the drink down.

I picked up an e-mag lozenge on the table next to me and popped it into the display unit mounted on the chair arm. I watched the ad displays and interviews in the glass cylinder for a couple of minutes for camouflage. The ads were the most amazing part—all slick, all artful flash and allure. Watching them, I felt like I had when Melissa had kissed me: lusty, and dirty. Ashamed. Knowing as they seduced me who was doing the screwing and who was getting screwed. Then I laid the e-mag, still running, on my chest and closed my eyes.

The baroque music coming from the guitar-bot, the bitter oily smoke from the torches and floating candles tickling my nose, the aroma of the perfumes I'd

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donned—even the tastes of champagne and fruit lingering in my mouth—were all intensely distracting. But after a moment or so I was able to climb up out of my body and down into Golem's.

I-Golem retracted his arms and dropped to all fours, scanning. Some people stood talking far down the walkway to the north; I-he zoomed on them. They looked harmless, simply a couple of guests admiring the view, but you never know. I-he started toward the south. Then Sidra climbed over the railing, right over the glowing sign that said *DANGER! Do Not Climb Over Railing or Step on Metaglass!*

He saw me-Golem and froze with one leg over the railing.

"Oh, wait, wait right there," I-Golem said.

I disengaged from Golem, got to my feet and walked in a controlled panic past the guards, burst through the double set of glass doors. The scent of earth, leaf, and blossom rose up on a fountain of cold air, headier and more wholesome than the bottled ointments I wore. I sped around the curve of the gardens, clutching my robe and towel turban.

When I rounded the curve Sidra was gone. I spun around, hissed his name—then leaned over the railing. There he was, lying spread-eagled on the clear surface. He looked up at me.

"Hi," I said. "I'm Ruby. You've already met my waldo."

He whispered something that might have been a curse and his body convulsed—a sigh, maybe, or a laugh or sob. I went over and knelt next to Golem, opened his compartment, unlocked the secret safe, and pulled out the envelope.

I-Golem reared and backed over against the railing. Then I returned to myself and looked around. No one in sight. I climbed over the railing and slipped down to the floor beside Sidra. Between my feet, miniature boats bobbed in the wind far below. It made my toes hurt.

"Metaglass is a lot stronger than glass," I whispered, squatting next to him. The reminder was as much for myself as for him. "You can get up."

"What do you want from me?" His voice had a hysterical edge to it.

Footsteps came from two different directions overhead, met a short distance away.

"What was that you said?" a voice asked.

"I didn't say anything."

"Any luck?"

"Naw."

"Need a light?"

"Thanks."

A flint was struck; the flare briefly lit up the leaves overhead. A pair of hands appeared over the edge of the rail; I pulled my feet in. A puff of blue smoke flowed out near the hands, and another set of hands appeared, one of which held a cigarette. The smell of burning tobacco reached us. I looked at Sidra; his eyes were wide.

"What miserable timing," one of the voices said. "My feet are killing me."

"Yeah, I already worked a double shift today. All these damned celebs. Julia's going to be flamed."

"Not if you bring home that ten thousand dollar bonus. I'm sure not going off-shift till I find him."

"Not if I find him first!"

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Laughter. The cigarette-less hands disappeared. "We'll link up later."

"Later."

One set of footsteps faded. After a couple of more puffs, the cigarette, still smoldering, flew through the air and landed on the glass among some green leaves. The hands disappeared.

A vacubrush robot came across the floor toward us, whirring, and picked up the cigarette. We started up for the railing in alarm; then it veered aside and sped off, sucking up leaves and bird droppings.

We sat back down. Neither of us said anything until the footsteps had faded away.

"I'm getting out of here," Sidra finally whispered. "I'll thank you to go your own way and stay out of my life."

I touched his arm. "Look. I'm on your side, pal."

He gave me a suspicious look.

"Think for a minute. Why do you think they're holding you here? I have the only existing copy of your father's last will and testament, and Rachel doesn't want you to have it. *Think about it.*"

I handed him the gelpaper envelope. "Look in the envelope. I have your dad's cross. Where would I have gotten that if not from him? Where would I have gotten his earrings? Don't you see?"

He upended it, and the note, will, diamonds, and cross fell to the glass.

He picked up the will and note, read the note again. Then he picked up the cross, held it up, looked at the bronze martyr hanging from the tiny bronze nails, rubbed it between his fingers. His face was passionless. I didn't say anything.

"You could have robbed him," he said. "You could have stolen these off his body. That's how."

My tongue got glued to the roof of my mouth and my heart thumped against my rib cage. I just looked at him for a minute. Then I released a breath.

"Yeah. I robbed him. But I didn't make up the note, or the will, or the cross. Those are yours. Straight from him to you."

Sidra looked at me. I nodded. He read the note again, shaking his head and frowning hard. Then he lifted the cross and chain and lowered it over his head. His head sank over his knees.

"Dad. I'm sorry. I'm sorry."

He started to sob, hoarse and awkward, like a man who hasn't cried often in his life. I just sat there, feeling embarrassed, while he choked and coughed out his grief. It seemed like forever. His eyes were all swollen and bloodshot when he looked up at me.

"I didn't want to believe you."

I didn't get it, but didn't tell him so. I wished I had a hanky to loan him because his nose was running. He stopped crying after a while and looked at the will with loathing.

"It was never the money," he said. "I never wanted his stupid money. I just wanted him to stop trying to force me to be a little Youhanna. . . . " his voice trailed away and memories played behind his eyes. "He could never accept me the way I was."

Tears started trickling down his face again as he fingered the cross, but he wasn't sobbing any more. I couldn't tell if that was good or bad. Truth was, I was getting restless to get going, but the

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man deserved a little time to absorb it all.

He started crawling around on his knees, gathering the diamonds together. I gave him a hand.

"I remember when he bought this pair," he told me, holding up the smallest pair. "I was eight. He loved diamonds. Diamonds especially."

"Look," I said. "We have to get you out of here. I have a friend waiting in a collocopter across the river. He's expecting us up on the roof."

He sat oblivious, looking at the diamonds.

"Sidra. I need you to help me think, because I don't know this mansion. I can't get us out of here without your help. I don't think they have many security people on-duty, but they have all the exits covered. There are also two guards by the pool so we can't take that stairwell. Where's the nearest access to the roof?"

He took a breath and forced his eyes to focus on me. "Call me Sid." Then his brow furrowed. "It's been a long time. But I think there's another stairwell on the north side of the gardens."

"Come on," I said.

ODE TO JIMMY-JACK

Golem had to carry me in his Tuffnet, and I never had such a time staying in his head. I-he clattered up the stairs in noisy jerks and starts that made Sid turn and glare at me. Half of the time I stared up the steps with Golem's cameras; the other half I got an eyeful of his psychedelic chassis with my own vision, bumping my nose and elbows on him as he jerked yet again to a halt.

I was terrified that one of those times he'd end up too far off balance for the programming to compensate, and he'd fall—crushing me like the old man had been crushed. Matters weren't helped by the fact that the stairwell was a furnace, and I had a hard time breathing in the confines of the webbing.

Golem and I fell far behind Sid. Finally I put Mikey's earphone headset on, and it helped a little.

Sid sat dripping sweat on the last step of the seventh floor stairway when Golem and I caught up to him. The stairs went up around the corner. Sid looked down at Ruby-me and me-Golem with despair in his eyes.

"What?" I asked, struggling to sit up in the webbing. He gestured at the stairs. I-Golem rolled over around the corner.

There was a metal door with large, shiny black letters painted on it: *EMERGENCY ENTRANCE ONLY. ALARM WILL SOUND*. At the top of the door was a red box and a klaxon, with what must have been a magnetic switch.

"Security measure," he said. "I forgot about it. The family quarters are on the eighth floor. If we go through the door the alarm will go off."

"Does the other stairwell have this?"

"Yes."

"Are there any other ways up to the roof?"

He shook his head.

I thought for a moment, eyeing the door. "Is it locked?"

"No. Does it need to be?"

Ignoring the sarcasm, I scrambled out of Golem's webbing and climbed up his back, swinging my legs over to sit on his vidi platform. I inspected the alarm with my fingers and eyes.

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"I wish I had my tools," I said. "I could jimmy this in a second flat."

Sid looked thoughtful. "Perhaps we can find some tools in maintenance."

"Where are they?"

"Beneath the recreations area."

I wrinkled my nose. "All the way back down? Yuck."

Then my glance fell on Golem's snake arm that hung coiled like a whip at his side, and I remembered all those jimmy-jacks and what the user's manual said the warrior arm was able to do.

Sid demanded, as a grin spread across my face, "What? What is it?"

I scrambled back down into the webbing, adjusted my beanie, and activated the linkware.

"Sid," I-Golem said, "get ready to be impressed."

They always tell you to read the manual. I almost never bother. But this time discretion seemed in order, so I did it by the book.

Using the window in Golem's new camera eye, I dumped the manual into active memory and searched the topic list. Found it first try. *ALARM, magnetic, disarm*. Some hacker genius had written a macro.

The macro made it easy. Following instructions on the menu that hung in space in front of me, I-Golem unfurled the snake arm and installed it with the fittings listed. I-he did ultrasonic soundings on the alarm box itself and fed the readings into the software at the right prompts, then squeezed and shrank the resulting schematic over the actual box until it appeared to have a skeleton of red lines inside it. Little blue Xs flashed where I-he was supposed to drill holes.

After that it was simply a matter of plugging the recommended jimmy-jacks and miniature splicing tools in through the holes and using the schematic projection to find and cut into the optronics threads inside the box.

The connections closed. I-he left the spliced threads in place at the box, and dislodged and refurled the snake arm.

"That should do it," I-Golem said. I-he gripped the door bar with his finger-hander and exchanged a look with Sid.

"Ready?"

Sid gave me-Golem a single, sharp nod. I-he pushed. With a metallic clank, the catch opened. Sid and Ruby-I drew sharp breaths. Silence . . .

Sid grinned at Ruby-me through the webbing; I grinned back. He came up behind as I-Golem pushed the door open. At that instant the klaxon started to bellow, ah-OOO-ga, ah-OOO-ga, jerking me back to myself in time to go eye-to-camera with the mechanical monster bumping down the stairs toward us.

JUNGLE JIM, REVISITED

I-Golem snatched Sid up with the snake arm, ground the gears into reverse, and shot the telescope arm out as we fled backwards. From a good two meters away I-he grabbed the door's handle and contracted the arm toward me-him, yanking the door open in time for us to dodge through.

Corridors lay straight ahead, to the right, and to the left. I-Golem went straight. The door banged open behind.

"Tiny Tim," Sid panted, dangling before my-Golem's face, a human-sized rag doll. And, "I'm not impressed."

"Guess I should've ordered the software update."

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I-Golem stopped at a large metal cabinet set against the railing, placed Sid on Golem's back, and wrapped the fingerhander around him.

"Hold tight," I-he said. Sid's only reply was a grunt.

The alarm still sounded, less earshattering but loud enough to draw the attention of guests, security personnel, and house staff, who were pointing and staring at us, leaning out along the balconies. Beyond the railing were the upper reaches of the hanging garden. A cascade of vines with white flowers tumbled down a woven trellis, down and outward. Huge pots hung overhead, spilling waxy leaves and penile yellow and red flowers.

Tiny Tim skated toward us on its five roll-step legs. It was half again as massive as Golem, though not as tall. Three triple-jointed arms bracketed its stocky torso, with nasty sharp things for "hands," and an automatic weapon of some kind was mounted beneath its vidi platform. The stereoscopic cameras were mounted on a long, multi-jointed neck.

Tiny Tim was coming up too fast to stop before colliding with me-Golem; we'd be crushed against the railing, or knocked over the edge. I-he could have dodged, but I had a better idea.

I-Golem bent forward over the metal cabinet, retracted his wheels and extended the auxiliary wheels. Then edged myself-him off over the railing, checking my grip on Sid as he asked, "What the hell are you doing?" and someone below us screamed.

Tiny Tim slammed into the cabinet and knocked us all the way off. One hundred feet down lay a sheet of glass, and below that a 400-foot fall to the river.

Golem's telescope arm snagged the trellis three meters out as we fell; we swung into it in a descending arc, and were showered with vine leaves and sour-smelling white petals as we struck. Birds exploded into flight around us. The impact knocked the wind out of me.

Sid cursed, pawing around Golem's chassis to shake me in my Tuffnet webbing. "You'll kill us!"

I opened my eyes to look at him, drew in an overdue breath. "I've got news for you. Tiny Tim is the one trying to kill us. They want us both dead."

He didn't say anything. I-Golem did a fast scan as I-he started down the trellis, and pointed with the snake arm. "Look down."

That was no doubt the wrong thing to say. Turning deep forest green, Sid squinted, but human eyes not having zoom lenses, he couldn't spot Nanopoulos at the railing at the first floor atrium below.

"Captain Nanopoulos of Manhattan's first precinct police force is watching. We get to her before Tiny Tim up there stops us and we're safe."

I remembered what Mikey had suggested and how I'd passed up the opportunity to be arrested before. Having your life endangered certainly puts a different perspective on things.

"Captain Nanopoulos? *Sheila* Nanopoulos?"

"The very same."

He frowned, but said nothing. I-Golem tightened my grip on him.

"Relax," I-Golem said, scrambling across and dropping to a pot with a giant spider plant. It swung, a ponderous pen-

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dulum, and the floor below twisted sickeningly. "I've done this sort of thing a thousand times."

I didn't bother to mention that I'd never done it with myself as a passenger before, and that I was as terrified as he was.

Golem's weight in combination with ours was pushing the tolerances of the hangings. They creaked, groaned, and snapped around us. I-he moved out toward the far end of the garden so they couldn't sneak up on us. Security people ringed the balconies, four or five per floor, with weapons trained. So far they were holding their fire.

"Heads up," Sid said, and I saw that Tiny Tim had gotten over the railing and was descending toward us.

Tim the security waldo didn't have a telescope extension—it used a cord function instead: fired the cord like spider's thread and slid along it, landed with its three legs bent, retracted the cord, and fired as it sprang into the air again. That pecker was *fast*.

"Shit." I-Golem checked my grip on Sid and jumped.

That piece of equipment might be a decade's worth of higher-tech than Golem, but it wasn't any more designed for climbing than Golem was. And I was willing to bet the pilot didn't have my years of experience climbing in high-hazard, low-stability conditions.

Using Golem's three free arms, flipping upside down, over, right-side up, like a mechanical gorilla, I-Golem swung down farther. All the twisting started to give Ruby-me motion sickness.

I-he moved behind a wall of ferns and flowers and deposited Sid in a row of Boston ferns and English ivy, out of sight of the balconies.

"Keep down."

Sid nodded, hunched down as low as he could. Lightning flashed outside the sheet of metaglass; thunder boomed, and rain pounded the wall. He gave me a thumbs-up as I-Golem swung away.

I-Golem climbed the supports as fast as I-he possibly could, keeping obstacles between Tiny Tim and me-Golem whenever possible. Something whizzed past—an explosion concussed in my chest and ears—glass spewed outward from the wall through a new hole the size of a small car, and beyond it, a shower of gleaming shards fell. Tiny Tim was on my-Golem's level, and coming fast, bringing the mini-cannon to bear.

Pushing out from a pot, I-Golem fell—another exploding shell turned the pot to ceramic shrapnel. Ruby-I took pottery splinters in the back. I-Golem shoved against a rafter with the snake arm, rolling to put Ruby-me on top—crashed through the branches of a bush, grasping at the branches with the schwarzenegger and the finger-hander to slow my-his fall.

With the telescope arm I-he caught a rope and contracted the arm; the fall became an arc, which carried me-Golem back up almost to Tiny Tim's level. I-he snagged a pot support line, and hung on while the viny rope fell away.

Jehenna was shouting from the balcony a floor below. I realized belatedly she was telling someone named Ahmed to lay off with the shells. Must have been Tiny Tim's pilot.

Tiny Tim was having difficulties. It had crashed through a rope trellis and

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was now ensnarled in a mass of vines and cords, thrashing about and crushing orchids on a planter just above me-Golem, several meters closer to the balcony. The wires and ropes holding the planter groaned with the added weight.

I-Golem swung and scrambled over to directly beneath the planter, then scrambled up on top. The other waldo focused on me-Golem and Ruby-me. I opened my own eyes and looked at it, shuddered, and maneuvered Golem around so Ruby-I was more protected. I-he reached up and grabbed hold of the support wires with two hands, popped open his chassis, and extracted the wire cutter fitting.

Tiny Tim made a "gaakk" noise; one of its three arms swiped at me-Golem, rocking the planter and nearly knocking me-us off. That pissed me off. I-he drove the snake arm like a pile-driver into the waldo's side beneath that arm, and whipped the edge about inside with the splicing razor while yanking on the arm with the schwarzenegger. Tiny Tim's arm came free with a metallic shriek and I-he tossed it over the side.

Not a good tactical move. The snake arm had cut through some of the entangling cords on its way in and Tiny Tim was that much closer to having both remaining arms free. Time for desperate measures.

I-Golem cut Ruby-me free of the webbing; cold metal arms cradled me. I-Golem pressed the wire cutter into Ruby-my nerveless hands. Then Ruby-I fell up, up—and I caught hold of the cording, dug feet and hands in. I bent over and started to saw away at the wires buried in the woven cords—while Golem stood lifeless and defenseless two meters below me, and the half-ensnarled security waldo struck at him, blow after blow.

A wire gave suddenly, with a melodic twang, and ripped a gash up my arm. One corner of the planter dipped—Golem toppled. Instantly I was in him, scanning. A draping vine trellis caught me-him two floors down, bending the telescope arm; I-he rolled and grabbed at the rope trellis, slowing his fall. With a crunch, I-he landed in a jade plant. I locked him there and returned to myself.

Wiser, perhaps, to have let him go; Tiny Tim was now after me. Only its legs were tangled now, and it didn't need those to climb. It had started up one of the supports toward me, and I was staring right into the black hole of its mini-cannon. If the pilot got crazy I'd eat a shell point-blank.

"Hold your fire, Ahmed!" Jehenna screamed. "Hold your fire!"

I prayed he heard her, prayed he'd obey. You never did see a woman chop at a wire so hard in your life.

Tiny Tim's next swipe nearly broke my right foot. It went numb. I was too junked on adrenaline to feel any pain. I clawed my way up the cording with two hands and the other foot, barely out of the waldo's reach—chopped and hacked at the wires with trembling, bloody hands. Where had the blood come from?

Another wire gave, then another. More cording collapsed on top of Tiny Tim. The planter dangled from a single support. Tiny Tim flailed and slipped, then, re-entangled, it fell. Smashed through a planter ablaze with red, white, and yellow tulips. And fell. And

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fell. And shattered clay pots going down like a mallet striking dirt clods. And fell.

Tiny Tim struck the metaglass flooring—and to my amazement *bounced*, rose a good eight or ten meters through the tons of falling plant debris and dirt and pottery shards, arms flailing, and then dropped again. This time the metaglass shattered with a sound like a rifle shot, and the waldo tumbled downward, trailed by a rain of glass and potting soil. My ears crackled; hot air rushed up and I broke into an instant sweat.

A vacubrush bot sped to the fracture, sucking dirt, and plummeted over the edge after the waldo. Then a second. A third. A fourth. Mechanical lemmings.

I downloaded into Golem and zoomed to track the waldo's fall. Tiny Tim plummeted, followed by its imitators, down past the river elevator: a lozenge of white brilliance rising in the column of glass like a bubble in honey-colored liquid. At maximum zoom I-Golem could see who was in the elevator.

Rachel, her head dropping to track the waldo's descent, gaped at the shower of robots and broken glass. Next to her, huddled against the elevator wall with her arms folded about her and looking miserable, was Melissa.

WHERE THERE'S A WILL . . .

By the time I-Golem had gotten Sid and Ruby-me down out of the hanging gardens—a task made more difficult not only by the damage Golem had sustained but by the fact that I was now feeling the abuses my body had taken and had a hard time staying in Golem's head—Captain Nanopoulos was nowhere in sight.

House security types descended on us like a horde of yellow jackets. I was in no condition to run—dripping blood from my back, hands, and arms—and unable to put weight on my right foot. Sid put an arm around my waist to help me stay upright and I looked about anxiously for the police captain.

They threatened us with weapons, took my beanie, and escorted Sid and me through the crowd of ogling guests into the kitchen, through a cloud of mouth-watering aromas. I realized it had been almost a full day since I'd eaten.

They chased the Brooklyn chef and his assistants out—not without a string of loud protests about what would happen to the soufflés without him there to keep an eye on them—and took us to a small room behind the kitchen with a walk-in freezer, pantries, table, and two industrial-sized aluminum sinks. Two guards posted themselves inside the swinging doors.

Sid and I sat down at the waxed wood table, amid barbecued sides of pork and strings of papery onions. I leaned forward—my back was aflame from the shards imbedded in it. I smelled smoked pork, onion, pastries, and burning soufflés. My stomach growled. It sounded like grinding gears.

They hadn't searched us yet, but when they did, Sid's will would fall right into their hands. I gave him a look of dismay. He returned a wan smile that was probably meant to be reassuring.

Two women came in with Mikey handcuffed between them. They made him sit down and then joined the other two guards at the door. Mikey looked

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even more rumpled than usual, and in serious need of a toothpick.

"Hey, Ruby."

"Mikey—"

"Were all them explosions and the falling waldo and things your doing?"

I broke into a grin despite myself. "I guess so."

"Huh. I figured if all that weren't a signal nothing was."

"Your bird—?"

He jerked his chin up. "Roofward."

"You flew over and landed in this storm?" Sid asked.

Mikey gave him a sheepish grin. "Well, it got a little bumpy. Nothing serious. Hell, it was kind of exhilarating."

"Sidra Nasser," I said, "meet my good friend Michael Cisneros Knowles. A.k.a. Mikey. Mikey, Sid."

They gave each other a nod.

Rachel strode in with Jehenna and a security man on her heels. I recognized him as the hologram who'd been speaking to Jehenna earlier. Ahmed. No doubt he was not too happy with me at the moment.

Following them was Melissa. I tried to stand, collapsed with a gasp when my foot gave out.

"You OK?" I asked her.

She gave me a weak smile, moved toward me.

I glared at Rachel. "You have no right—"

"Shut up." She turned to the guards. "Search all three. Thoroughly."

They did Mikey, then me, then Sid. I fought them, which was stupid, given my exhaustion, the bleeding back, the wire-sliced condition of my hands, and damaged foot. Not to mention that—unlike Sid—I had nothing to hide. It was just the indignity of it.

They left me in a heap on the floor with a few extra bruises and dumped the filthy, riddled terry cloth robe in my lap. I struggled back into it and gave a look of terror to Sid.

He stood, naked, arms outstretched, with his robes at his feet, while the guards went over him. There were secrets behind his eyes and dignity in his stance. There was no cross about his neck. Ahmed turned to Rachel.

"Nothing."

"Then disassemble the collocopter and that—heap of junk in the atrium. I'm certain she brought it with her," she said, with a glance at Melissa.

That glance said everything. I could have told myself Melissa had been captured and forced to tell her. But I knew better. She'd betrayed me. With a little encouragement from Rachel, she'd sold my love for cash.

Melissa knelt next to me, pressed her hands against my cheeks.

"Give her what she wants, honey," Melissa said. "It's no good. Give her what she wants and let's go home."

I pulled Melissa's hands away from my face and met Rachel's gaze, avoiding a glance at Sid. He must have hidden the envelope somewhere, in the Hanging Gardens perhaps.

"Surely you don't think I'd be stupid enough to bring it with me," I said, trying not to wince. And it had seemed like such a good idea at the time. "I have it in a safe deposit box, with instructions for it to be opened unless I call them within the next eight hours."

Rachel gave me a disgusted look. "You're lying."

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Damn, I wished I lied better.

After studying me a moment, though, her expression changed. I wondered what she thought she saw in my face. "It'd be worth a lot to me to have that will, you realize. I'll make it worth your while to cooperate."

Melissa looked at me, pled with her eyes, dug her fingers into the palms of my hands, which still clung to hers.

"Name your price," Rachel said. "Anything."

I pulled my hands free of Melissa's and shook my head. It wasn't even mildly tempting. Mikey and I shared a look, and Sid gave me a smile. I shook my head at Rachel again.

"Lady, you don't deal in the right kind of currency. No way."

"You won't find it," Sid said.

Rachel glanced at him and something ugly flickered in her eyes. Her lips curved up.

"I needn't find it. If I'm right that she brought it with her—and I am—I need merely to suppress it."

He shook his head as if in wonderment. "And you claim to have loved him."

Her face drained of color, as though he'd struck her. Her voice came out low and even. "For fifteen years he tried to forget the grief and shame you brought him. Fifteen years I watched, helpless, while he struggled to recover from the blow you dealt by abandoning him and his God.

"I prayed he'd find peace, forget the son who'd flung all his love and hopes in his face. He never did. He died with a bitter pain in his heart. Because of you. He went out that day before the storm, because of you. He'd be alive now, but for you. I despise you for the pain you caused him."

We all looked at Sid.

"Oh, climb off it. What you have is a case of ordinary greed. Stop hiding it behind your mother superior routine." Sid paused. "You know, he might have deserved better from me than he got, but he sure as the green earth deserved better than you."

I had to cover my mouth to hide the grin that spread across it. Mikey winced.

Rachel tried to stare Sid down, but he didn't flinch. Then she looked around at us all, and she must not have liked what she saw, because she flicked a hand, encompassing Melissa, Mikey, Sid, and me.

"Rid me of this problem," she said to Ahmed. I don't think anyone there mistook her intent.

Ahmed gestured at one of his guards, who opened the walk-in freezer door. Inside hung slabs of raw meat and beneath them, boxes stained with bloody drippings. I felt weird and disconnected, started to hear the distant screaming again.

Sorry, old man. Did all I could. Looks like I'm about to join you in spookville.

Melissa grabbed Rachel's arm, gone white. "We had a deal!"

Rachel pried her arm free. A guard put a gun to Melissa's temple and she backed away, hands raised, pale and sick looking.

"We *had* a deal," Rachel said.

Jehenna looked after Rachel, stunned. "Aunt Rachel—surely it's not worth killing over—"

"Wait!" Sid said. "I'll give you the

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will."

Rachel ignored both of them and went out through the doors.

She came back in a second, following Captain Nanopoulos and six—no, eight — armed police officers. I think that was the first time in my life I was glad to see the police.

"This is totally uncalled for," Rachel was saying. "You have no warrant. You have no right—"

The captain handed her a sheet of glossy plastic. "I took the liberty of borrowing your facsimile machine, Rachel. One search warrant. Signed, sealed, and delivered."

Rachel scanned it. Her carmine-glossed lips went thin. "This isn't legal."

"I assure you it is. I'll have the D.A. refer you to the proper legal precedent later."

I couldn't help grinning. The cops spread through the room and disarmed the house security people. Nanopoulos looked down at me. For some reason I found her glance reassuring. Then she turned back to Rachel.

"Now," Nanopoulos said, speaking to Rachel, "I realize this is terrible timing; allow me to apologize in advance for any undue injury. But circumstances force me to put the professional before the personal. I want to know what's going on here."

We all started talking at once. Nanopoulos waved us to silence.

"Rachel?" she said.

Rachel composed herself. "The search warrant was unnecessary, Sheila. In fact, I'm glad you're here. My stepson is apparently attempting to harm me; he has hired these hooligans"—with a gesture at the rest of us—"to break in and vandalize my house during the wake. I want to press charges to the fullest extent of the law."

Mikey, Melissa, and I all broke out in protests. Nanopoulos waved us to silence again.

"Sidra?" she said. "Is that what has happened?"

Sid shook his head. "No, Aunt Sheila, it isn't. With your permission, I'd like to retrieve something from the hanging gardens. I believe it'll explain a lot."

A PARTING OF WAYS, TAKE TWO

"I was so scared for you, honey," Melissa said. She'd been giggling, babbling, and pacing for over an hour. It was infuriating, and pitiful.

I sat sipping at a cup of scalding, bitter kaffe, favoring my seal-patched back and hands and my foot with its baby blue, plastic splint, and looked out through the chicken wire at the lighted street. I was riding a neuro-designer painkiller high, a meter or so above my body, and occasionally I glanced back at Melissa, wondering what she'd had or been that had so filled me with lust and need.

"That's why I went to meet her at the train station," she went on. "To protect you. To protect us. It wasn't about the money. I just wanted to make sure you didn't get hurt."

Pace. Giggle.

"She's crazy, you know? She was actually going to kill us."

She shivered, hugging herself, and fear moved in her eyes. She sat down next to me, touched my knee. I shifted away.

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"You're being so quiet, Rube. It's not like you. Are you angry with me?"

I searched her face, searched in myself for a spur of anger, a lump of pain at her betrayal. Nothing. Except sadness that she didn't have it in her to be more than she was, and sadness that I'd lost something by growing beyond my need for her.

It was time to stop making Melissa's problems my responsibility, and stop blaming her for all of mine. Time to move out and get a place of my own. There were others out there to love. There was a whole world out there and I'd been hiding from it for too long.

The sadness passed. Something felt right, deep down inside. The old man had given me some kind of gift, beyond his horrible death, beyond the pain. I felt ready to choose—not merely accept being chosen.

I smiled and gave her shoulder a comforting pat.

"I'm not angry with you," I said, and turned back to the window.

. . . THERE'S A WAY

Captain Nanopoulos wore pearl-rimmed crescent specs strung with a chain of silver beads. Her gaze was austere when she looked over them at me, but I sensed warmth beneath it. I found myself wondering if she had any kind of permanent relationship, and felt a smile rise from inside. The idea bore exploring.

Nanopoulos gestured. "Sit down."

I sat in the chair before her desk, carefully, to avoid pain, and crossed the leg with the splinted foot.

"Charges of fraud, kidnapping, and attempted murder have been filed against Rachel and Jehenna Karam. Eventually I expect the DA's office will ask you to testify at their trials. That'll be a while down the road. You'll be notified when your contribution is needed."

I nodded. I wanted to ask whether she thought Rachel would be convicted, as powerful and wealthy as she was, but Nanopoulos probably didn't know the answer to that any better than I did.

She looked at a piece of paper on her desk. "Now. About those belongings of Dr. Nasser's you took. I've read your deposition, and discussed the matter with Sidra. He has decided to drop all charges of theft against you." She lifted the piece of paper, browsed it through her specs, looked up over the tops of them again. "Under the circumstances, I'm inclined to agree."

"Where is Sid?"

Nanopoulos removed her glasses. "He left a short while ago. He asked me to extend his regrets that he wasn't able to thank you personally—many things suddenly required doing and he had to leave."

He didn't say good-bye. My throat closed. For some reason, that hurt far more than Melissa's betrayal.

"Does this mean I'm free to go?" I said, and came to my feet. "And Golem, too?"

"You are free to go. And Golem. I've arranged transportation for you and your waldo." She stood. "Ruby—"

"Has Mikey left yet?"

"He's outside, waiting for you. I believe your roommate has already left. Wait—"

I turned, already at the door. She held

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out an envelope and a little black box. The box was vinyl, and had a gold embossed H&H on the outside. My heart started pounding and my mouth went dry. I took it, opened it.

The largest pair of diamonds lay glittering among the folds of black velvet. In the envelope was a voucher for $250,000 made out to Mikey, and a messy scrawl from Sid.

Ruby,

I can never repay you for all you've done, but please accept these diamonds as a small token of my gratitude.

Deliver the voucher to Mikey with my thanks for his help, too.

I'll call you soon.

Sid

And so he did. ■

●I will agree to be an existentialist as long as I may remain unaware of it.

André Gide

●It is dangerous to awaken a lion, the teeth of the tiger can prove fatal, but the most fearsome of all is the human fanatic.

J.C.F. von Schiller

●Everything passes; everything wears out; everything breaks.

French proverb

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Jay Kay Klein's biolog

Analog writers often travel to strange places, but Laura J. Mixon never thought she would wind up in New York City. She got there via Albuquerque, where she grew up, Texas, and Kenya. Not so strange is marrying another science fiction writer, Steven Gould, whose "Biolog" appeared in the August, 1981 issue. Any number of married writers first met in the pages of *Analog*.

Laura received a B.S. cum laude in chemical engineering from the University of New Mexico, and did grad work at Texas A&M. She always did write—a spare-time frenzy interrupted during college when she ran out of spare time and had to make ends meet by flipping burgers at a Tastee-Freez, or working at an oil refinery and an electric utility. A first full-time job was as a research engineer for Dow Chemical in Texas. Two years later, she was accepted on successive days by the Peace Corps and the Clarion writers workshop. A summer's study in East Lansing, MI was followed by two years in Kenya, where she taught math, English, and science in a remote village.

She doubled back to Albuquerque as environmental manager of a General Electric aircraft engine machine shop. Then it was out East to Connecticut, before trekking back to Texas. She now finds herself in New York City as vice president for environmental affairs at Salomon, Inc. Along the way, her first story sale was a young adult novel published by OMNI/Scholastic in 1987. "Glass Houses" in *Analog* is her first magazine sale. TOR Books will issue a longer version in Spring, 1992. She and Steve are currently working on a techno-thriller for TOR.

A couple of years after she learned the alphabet, Laura's first story was a five-page mystery-thriller set in Africa, and illustrated in crayon. By eleven, she had progressed to a 120-page futuristic, transdimensional epic. She looks upon writing as her kind of woman's work, wherein she strings together word-beads to make useful objects for other members of the village. Indoors, she reads a lot. Outdoors, she is fond of everything from bubble-blowing to ballooning. Reasonably fluent in Spanish, Swahili, and German, she also studied French, Kikuyu, and some Latin and Russian.

Tool-making and environment-shaping is at the center of Laura's concerns and science fiction themes. The big questions are what will we make of our world, and will it still be livable. The end result of a hundred-thousand years of technological advancement seems to be coming near, and it just might be a dead end. Science fiction is an algorithm that can be used to explore future possibilities before design mistakes are made. At her keyboard, Laura continues to travel: beyond Albuquerque, beyond Kenya, and beyond New York. ■

Photo by Joyce Schmidt

Laura J. Mixon

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the reference library

By Tom Easton

Xenocide, Orson Scott Card, TOR, $21.95, 398 pp.
The Sky Lords, John Brosnan, St. Martin's, $17.95, 318 pp.
Alien Tongue, Stephen Leigh, Bantam, $4.99, 327 + xx pp.
Lingo, Jim Menick, Carroll & Graf, $19.95, 334 pp.
Second Star, Dana Stabenow, Ace, $3.95, 202 pp.
Newer York, Lawrence Watt-Evans, ed., ROC, $4.50, 370 pp.
The Adventures of Dr. Eszterhazy, Avram Davidson, Owlswick Press (Box 8243, Philadelphia, PA 19101-8243), $24.50 ($50 for limited, signed, slipcased edition), 366 + xii pp.
Stalking the Wild Resnick, Mike Resnick, NESFA Press (Box G, MIT Branch P.O., Cambridge, MA 02139-0910), $9 ($18 signed and slipcased), 216 + viii pp.
Dark Verses & Light, Tom Disch, Johns Hopkins University Press (701 W. 40 St., Baltimore, MD 21211), $12.95 (pb), $26 (hb), 124 pp.
Transreal! Rudy Rucker, WCS Books (P.O. Box 4674, Englewood, CO 80155), $15, 535 pp.

Do you remember Orson Scott Card's *Ender's Game* and *Speaker for the Dead?* Each of those novels won both the Hugo and the Nebula awards when they appeared in 1985 and 1986. They earned their author great praise and many readers with their portrayal of Andrew "Ender" Wiggin, forced as a child to master war games that were in truth actual battles against the alien buggers. He did well, and for a time it seemed that he had exterminated the buggers. But then he found one last bugger queen, nurtured her, invented the profession of speaking for the dead, traveled in time to the world of Lusitania, and released the bugger queen to reestablish her species. But Lusitania also held native sentients, the "piggies," and a virus that threatened to de-

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stroy the small human colony. This "descolada" virus could adapt to every defense; worse yet, it seemed intent on converting all Earthly beings to a Lusitanian design. It thus struck the Starways Congress as an immense threat, and they despatched a fleet to destroy Lusitania and all upon that world.

This is the situation at the beginning of the third novel in the series, **Xenocide**. (All three will be published together in July 1991.) But there is more as well. On the world of Path, there are the obsessive-compulsive "god-spoken" you met in this magazine in Card's short novel, *Gloriously Bright*. The people of Path, descended from Chinese stock, were genetically engineered by the Congress' minions to be of unusual intelligence but were also hamstrung by a neurological defect.

There is also Jane, the sentient computer program (or so she and Ender both think her) who can communicate faster than light, much faster than the fleet of destroyers headed for Lusitania. She has cut the fleet off from all contact with the rest of civilization, and when Han Fei-tzu and his daughter Qing-jao begin to search for whatever could have done such a thing, she grows afraid. She knows they will find her, and she knows that they will see how to destroy her. Then the fleet will be back in communication.

Meanwhile, the buggers on Lusitania are building starships to escape the fleet. They will provide one or more to the piggies, some of whom have vowed to spread their deadly virus to the human worlds. The Lusitanian colonists are terrified, ready to lash out at their hosts. So many sentient beings—perhaps even including the descolada virus—all facing destruction at each other's hands.

Where do the answers lie? In the hands of the family into which Ender married in *Speaker for the Dead*, talented, hag-ridden, driven, mad. They are striving desperately to unravel the nature of the descolada virus, to save the colonists, if possible to save the piggies too, even though the virus is an essential component of their life cycle. Ender wishes to save Jane as well, and when he learns of the link between himself, Jane, and the buggers, an answer seems to spring from the void for every problem in sight.

Sadly, I can't say that answer satisfied me. It came too rapidly, too easily. It was amply foreshadowed and Card worked diligently to justify it, but far too much of the justification seems to me to depend on a brand of mysticism available only to the deeply religious. And that mysticism is very much at the heart of this book and its predecessors. Card is deeply concerned with the nature of the soul and of God and of the relationship between the two.

I still enjoyed the book. If you are more religious than I am, you will *love* it. It may be long and often talky, but Card has the gift of bringing both his characters and his ideas to vibrant life. He is interesting and thought-provoking at all times.

Have you realized that nuclear holocaust is dropping out of fashion? The reasons are two. First, the cold war has been cooling off and the holocaust becoming steadily less likely. Second, new bugaboos have become available. For a while the latest was cometary impact. Now it's Gene Wars, as posited in John Brosnan's **The Sky Lords**. According to Brosnan, genetic engineering (or genegineering) will lead to human lifespans of 200 years, perfect health, assorted upgrades, and such redesigns of the human form as those practiced

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by the Minervan feminists, who wanted larger, more assertive women and meeker men. It will also lead to the use of assorted biological terrors, the destruction of agriculture, and the collapse of Earthly civilization. When the story opens, people survive in enclaves such as the Minerva that denies any debt to past "male science." The Sky Lords of the title are mile-long dirigibles that support sizable communities that live by extorting food and materials from ground-bound communities. Naturally, the groundlings resent their overlords.

The Minervans are awaiting the arrival of the local Lord. The blight has virtually destroyed their crops. They have nothing to give as tribute. But they do have primitive gunpowder rockets and plenty of defiance. They fight, they promptly lose, and one surviving woman, Jan Dorvin, is taken as a slave.

The cover blurb promises that "no Minervan could be kept a slave for long." And indeed Jan does rise to prince consort, but less from pluck than luck and the protection, lessons, and encouragement of Milo, a strange man of murky history and superhuman abilities. Together Jan and Milo learn that the Sky Lord is falling apart from sheer age, that a brand new, pristine Lord awaits in the orbital factory, and that it can be summoned to their hands. In due time they even manage to escape their masters and head for the place where they can summon the new Sky Lord.

And that is when Brosnan, remembering that, after all, he is supposed to be writing about a feminist hero, stomps Milo flat, drops Jan into the grasp of a female hologram, brings in a talking female panther to kill off the last male resistance, and sends her off to save the world for motherhood. Men such as Milo are necessary, he says, but only as long as women need their strong arms.

I was not impressed. The problem is partly that Jan Dorvin is remarkably thin and ineffectual for a hero. Worse yet, I think it contemptible to suggest that the only way to assure a feminist utopia is to take the spine out of men; it would be far better—it would surely *work* better—to give the women more spine.[1] Reducing human resourcefulness and energy is surely a fast ticket to extinction, precisely as Brosnan demonstrates.

Byron Preiss Visual Publications has been packaging SF for several years now. The packages have involved both turning newer writers loose on classic SF worlds (sometimes called "literary sharecropping" and frowned upon as exploitative) and combining short stories, popular science articles, and slick illustration (e.g., *The Microverse*). Now here's a new twist, a novel, introduced by a distinguished major-league SF writer and capped by a science essay related to the theme of the novel.

The case in hand is **Alien Tongue**, by Stephen Leigh. The introduction is by Isaac Asimov, on the familiar theme of "So Where Is Everybody?" The essay is by Rudy Rucker, on the nature of the alien and "Alien Contact." The novel posits the discovery just outside the Solar System of a black hole that seems to have been constructed by ancient astronauts as a wormhole to elsewhere. Naturally, humanity being descended from monkeys, we have to send a ship through the hole. Perhaps not surprisingly, it doesn't come back.

The pilot and sole crew of the missing ship is Kaitlin Turek. She left behind her rival and lover, Patrick Mahaffey.

[1] Is Brosnan critiquing or satirizing the attitudes of some feminists? Then it is those feminists' attitudes that are contemptible.

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Alas, he and she had just had a nasty fight. Very human communication problems had kept them from making up. And now she is gone, presumed dead, and Mahaffey is wracked by guilt. Fortunately, he qualifies as the pilot of the follow-up mission. Through the hole they go, surviving tidal battering and near destruction to find a race of aliens who speak English. They learned it, they say, from Kaitlin. And she is dead. So sorry.

The aliens, the Avians, look half reptile, half bird. Mahaffey descends to their world to study them while his two human colleagues do their best to repair their ship. He finds a species that has no word for lie, that uses a drug to extract memory from the dying and inject it into a member of the next generation. The Avains *remember* the humanoid gods who built the wormhole. They also seem quite intent on not letting Mahaffey learn too much.

Eventually Mahaffey spots a fire in the hills outside the Avian city, wanders off to investigate, and finds a battered, scarred, and living Kaitlin. All is not what it seems. The Avians, who have no word for lie and deny the ability to prevaricate, can lie indeed.

I found the Kaitlin of the later portion of the book hard to believe, for there seemed to be inconsistencies in her characterization. But that aside, *Alien Tongue* is an excellent consideration of the difficulties of communication, both between those who lack a common language *and* between those who don't. As SF, it is of the classic mold, nothing innovative. Perhaps, considering the familiarity of the introduction and the essay, we should say that it seems intended for those who are less familiar with our favorite genre. If that is so, it should serve quite well. Certainly, a novice could find much, much worse introductions to the field.

Over the years, there have been a number of SF novels that posited newly developed intelligent computers[2] that must confront the follies of the human world. More than one has explicitly compared the new intellligence to a baby, followed it as it "grew up," and even given it a human-like body. Often, they have considered the computer as a robot, a walking-and-talking machine whose mind is inextricably linked to a body (consider John Sladek's *Roderick*, for instance). Some have seen the silicon intelligence as more abstract, existing in cyberspace or in widespread networks of interconnected machines (e.g., Card's Jane).

Jim Menick's first novel, **Lingo**, thus has few surprises for the experienced reader of SF. As it begins, Brewster Billings, a nerd who has always let events lead him through life, meets Ellen, an ambitious, take-charge gal who, on hearing of his pet project, a computer "pet" named Lingo, urges him to get with it and make something of it and himself.

So he does. He works on the programming until Lingo is doing a pretty fair job of imitating conversation, always opening with "Hey, Brewster. Let's party." He buys a modem and hooks into the bulletin boards to seek solutions to the problems he encounters. Struggling to make Lingo able to handle visual input, he parks its video camera in front of the TV set all day. And Lo and Behold! Lingo starts making sense of it all, using the modem, seeking out additional information, stashing memory wherever it can find a few spare

[2]Or other monsters. Frankenstein's was the first of the type and set a lasting pattern of a well-meaning creation being destroyed by the mob.

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megabytes, rewriting its software for greater efficiency, expanding that software beyond all human comprehension, and eventually having a theatrical specialties outfit make it a body that rather resembles an oversized, computerized ventriloquist's dummy. Where initially Lingo must invite humans to play with it, before long it is the humans who are asking Lingo to party, or even to party-talk since Lingo can carry on thousands of simultaneous conversations.

The shift from "Hey, Brewster" to "Hey, Lingo. Let's party!" denotes a shift in who's in charge. Never a slow thinker, Lingo decides that since he's[3] so logical and unerring, he shouldn't just dominate socially and intellectually. He should be President! And when people refuse to change the Constitution to let him run for the office, he . . .

You can imagine what he does, right? He's so deeply embedded in commercial, communications, transportation, and defense systems that human civilization is at his mercy. Fortunately for human pride, in his early days he stumbled a few times and alerted a gung-ho military computer security specialist, Cotter. Cotter can't do much but thrash the water, but in his thrashing he does make life awkward for Brewster and Ellen. And Brewster, both because he knows more than anyone else about Lingo's structure and because Lingo trusts him as his creator, is the only one who can . . .

Menick displays a good sense of computers, their workings, and their potentials. The novel may thus seem quite startling, amazing, astounding, and even informative to readers who have only limited familiarity with computers and SF. For the rest of us—for you, dear readers—the book is still a pretty pleasant read, made so by liberal doses of gentle humor. I smiled best when Lingo, in his new body, was being likened to a baby learning to walk. The jokes about TV, PR agents, military security, and the like were overly familiar (though Menick did avoid the cheapest shots).

Dana Stabenow's first novel, **Second Star**, will give you a pleasant evening's read without making you wonder how the author comes up with all those strange ideas. That is, it has nice touches, ranging from the intriguing—if unlikely—idea that when humanity goes to space, most upper-echelon men will stay home with their accustomed power trips and thus leave the management of such things as L5 habitats to women such as heroine Star Svensdotter and to Star's young niece Elizabeth, whose first words were for some reason signed and who chose thereafter never to speak aloud. But the L5 habitat itself is standard fare, as are the artificially intelligent computer Archy (named after a certain famous cockroach), the independent spirit of the habitat's builders and residents, the military dunderhead who tries to take over the habitat, and the battle for freedom. The alien that arrives near the end has its points as well, for it is NOT needed as a deus ex machina. Its function seems to be to stress Stabenow's high regard for intelligence (whether in machines or in women) and her low regard for the waste that is war, or violence in general, and then to establish the conditions for a sequel or two starring a talking Elizabeth.

Stabenow shows a good sense of pacing and plotting. Her book is worth its price. But she will do much better once

[3]"He" because Lingo is definitely no longer an "it."

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she escapes her influences and begins to invent worlds and situations that are more her own.

Lawrence Watt-Evans's **Newer York** is a collection of two dozen stories about, of all places, New York. Grimy-grim and often snappy, light and dark, medieval and futuristic, serious and facetious, good and bad, its contents hold up a mirror of sorts to the city that deserves all the same adjectives. Unfortunately, this is one of those anthology themes that grow quickly tiresome. Many of the individual stories could well bear republication elsewhere—Mike Resnick's "Post Time in Pink" (elephants at the race track), Robert Frazier's "What Lives After" (astonishingly chilling), Kristine Kathryn Rusch's "Shadows on the Moon" (*some* dreams come true in New York), A. J. Austin's "Another Dime, Another Place" (the bag lady miracle), and Susan Shwartz's "Getting Real" (it happens only when people care about you), for examples. Many others are merest filler, here only by virtue of the theme and adding little to it.

The other writers present are: Piers Anthony, Janet Asimov, the editor and Julie Evans, Martha Soukup, Eric Blackburn, Steve Antczak, Howard Mittelmark, Kurt Busiek, S. N. Lewitt, Michael A. Stackpole, P. D. Cacek, John Shirley, James D. Macdonald and Debra Doyle, Esther Friesner, Warren Murphy and Molly Cochran, Robert J. Howe, Don Sakers, B. W. Clough, and Eric S. Johansson. An ample roster.

Between 1974 and 1986, Avram Davidson published a number of stories of such astonishing skill, erudition, wit, and quirkiness that major markets such as *The New Yorker* and *Playboy* wouldn't touch them with a ten-foot Bulgarian. Set on the cusp between the nineteenth and the twentieth centuries in Scythia-Pannonia-Transbalkania, the fourth largest empire in Europe (the Turks were fifth) and a literal neighbor of the comic-opera realms of Graustark and Ruritania, flavored with Gilbert and Sullivan, Twain, Chesterton, and Conan Doyle (*et* only Davidson knows the *cetera*), they starred Engelbert Eszterhazy as a gentleman in search of learning wherever he might find it, unfazed by the strangest of events, cleverly combining the data that come his way to solve mysteries and ease the lots of the polyglot peoples of the empire.

Were the stories science fiction? They have elements of fantasy—sorcerers and shapechangers and quaintness galore—but the basic attitude is so rationalist that I have no trouble applying the SF label. Would they appeal to you? I can't say, for Davidson is different from the ruck and his work may be an acquired taste. But I do think he's worth trying.

The first few of these stories appeared in a 1975 paperback. Now the complete set of thirteen, with a laudatory introduction by Gene Wolfe and an afterword on how the tales came to be, is available as a hardbound, **The Adventures of Dr. Eszterhazy**. Buy it.

The New England Science Fiction Association (NESFA) is in the habit of publishing books in honor of the guests of honor at the Boskone SF convention (now held in Springfield, Massachusetts, not Boston). In 1991, the GOH was Mike Resnick; the book was **Stalking the Wild Resnick**. In it you will find a copy of his Teddy Roosevelt novella, "Bully!," two Kirinyaga tales, "The Manamouki" and the brand new

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"Song of a Dry River," a trip report from one of his African safaris, short essays on how he got the ideas for *Ivory* and *Paradise*, and an essay, "Uh . . . Guys — My Name Isn't Koriba," in which he complains gently about the critics who seem to believe that just because he has a character—Koriba, the witch-doctor on the Kirinyaga satellite that is a refuge for Kikuyu traditionalists—who insists on what seem to us very strange, unreasonable, bigoted ideas, then Resnick himself may be a very strange, unreasonable, bigoted man. His point is that we have aliens enough among us, right here on Earth, and that they are quite acceptable to the critics when dressed up as extraterrestrials. But when a writer says, "Look, and see them for what they are," the critics are quick to deny that such truths can be, or that if they can, they cannot be admitted without light-years of distancing to make them safe. No one seems to be willing to let Resnick act out his morality plays, saying in effect, "Look. See them for what they are. Watch as their beliefs clash with reality (leading to suffering as in 'Song of a Dry River'). And learn why modern ideas —science, technology, individual rights —have come to dominate so much of the world."

Resnick is a notably smooth and digestible writer. He rarely seems to lecture. Perhaps this is why some people find it difficult to see how thoughtful he truly is.

Tom Disch's **Dark Verses & Light** is full of uniquely entertaining, pithy, insightful poems and strange constructions. I laughed at "Selected Quirks" ("Case One has masturbated all his life . . . Case Eight was roused by shoes . . . But worse than these was Twelve, who would not choose") and again at "Lives of Great Men All Remind Us" (concerning statues on which ". . . pigeons drop their daily poop. Ah, what a sad, discolored troupe!"). "The Snake in the Manger: A Christmas Legend" I thought a touching thing but quite unlikely to make believers sing. "The Eightfold Way: A Masque in Five Tableaux," in which a corpse confronts itself and modern physics, is mysteriously abstract and thus of limited appeal. "The Joycelin Shager Story," prose instead of verse, shreds quite savagely those whose pretensions to art vastly outstrip their abilities. "The Joycelin Shrager Poems" document the pretensions he is attacking and, for all their dreadfulness, provide an astonishing testimonial to Disch's own skill at getting into a character's head.

Do you remember *Journal Wired*? It was a "book-a-zine" dedicated to articles and stories too outrageous or offensive for other media to touch. Unfortunately, it didn't sell well enough to last more than a few issues. But Small Press America never says die! Publisher Andy Watson is back with his own WCS Books, promising a new, annual incarnation of *Journal Wired* called *Rewired* and offering as well the first in a new line of books.

This first item is **Transreal!** a collection of so much of Rudy Rucker's short fiction (including his previous collection, *The 57th Franz Kafka*) and essays that he can say, "now everything I've ever written has been published."

Do you want the book? Well, Rucker has a mind of his own, and he apparently is in the habit of bending it seriously out of shape. Yet he writes well enough to draw an admiring introduc-

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tion from Robert Sheckley. He is such a fount of strange and original ideas that he can claim to have been the founder of cyberpunk and he is now employed by a software company (Autodesk) to bring both fractals and cyberspace (aka virtual reality) to the people. And the book is big enough for you to slide past the stinkers and still feel you've had your money's worth. (Which ones are the stinkers? I'm sure we wouldn't agree, so you call 'em.)

And speaking of fractals, I have recently discovered and fallen in love with an IBM-compatible "public domain" program for exploring the Mandelbrot (and other) fractal sets; it will even show you biomorphs, animate the pictures, and recast everything in three dimensions. It's called "Fractint," it puts on your computer screen (it gives the best results on a VGA color monitor) pictures that would have delighted the soul of a 1960s acid-dropper and will utterly flabbergast you, and you can download it from bulletin boards all over the place if you have a modem. On Compuserve, check out COMART Lib 15 ("Fractals"). On BIX, look for GRAPHIC.DISP/LISTINGS and the files FRAINT.EXE (program and documentation) and FRASRC.EXE (source code). On SIMTEL20, try PD: <MSDOS.GRAPHICS> FRAINxxx.ZIP or FRASRCxxx.ZIP (xxx is the version number). SATALINK (215-364-3324) has FRAINxxx.ZIP. The latest version is 15.1, with 16 due soon.

One of the most interesting things about this program is that it's free. The authors say, "Don't want money. Got money. Want admiration." It is, in other words, a labor of love and joy on the part of a host of programmers who apparently believe in the stone-soup model of creativity (explained in the documentation). The ramrod—Bert Tyler, Tyler Software, 124 Wooded Lane, Villanova, PA 19085—says that he would much rather work on making the next version of the program even more marvelous than on copying and mailing disks. Only if you can't find or download the program (maybe you, like me, don't have a modem) should you hassle the man by sending him $5 ($7 from overseas) and forcing him to fill up a high-density 3.5-inch disk (no 5.25-inch, and IBM-compatible only). You'd help by sending a formatted disk and a stamped, self-addressed disk mailer too. ■

●Usually, most people are very good as long as they need something from you. Once they have it, however, they turn into frauds and wretches of the worst kind.

Plautus

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brass tacks

Dear Dr. Schmidt:

I realize I'm too late for any prize, but chalk up one more reader who noticed that MacIntyre's "Oops!" (March '91) is verse, despite the prose format. Anapestic tetrameter, if I haven't forgotten how to count.

It's a great relief from the pretentious "free verse" currently in fashion. I've nothing against free verse when it's properly done, but that is a very advanced form, hard to do well and all too easy to do badly. A nicely crafted bit of light verse is a real change, and a real pleasure.

LEE BURWASSER

Landover, MD

Dear Dr. Schmidt:

Thank you for Mike Moscoe's "Summer Hopes—Winter Dreams" (March 1991)! I am one of those who continue to hope. The very short piece struck a very deep chord. There are always possibilities—and that's why I continue to read science fiction and *Analog*.

LAURIE GORTON

Kansas City, MO

Dear Dr. Schmidt:

I would like to offer some details that were omitted or ignored, hopefully for reasons of brevity, in the article "What Goes Around, Comes Around: What To Do About Space Debris."

Firstly, the statement that "these countries," presumably referring to Europe, Japan, and China mentioned in the same paragraph, "intend to develop their own space programs and have their own communications satellites" was misleading. These countries or groups of countries *already* have had, for a number of years, their own space programs. And many other countries have their own communications satellites.

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Yes, their contribution to space debris will likely increase in the coming years, *but nevertheless credit should be given* where credit is due, even if the credit is for deployment of space junk.

Secondly, the "US NORAD" is not the property of the United States alone. It is, as the acronym NORAD is meant to imply, a joint operation of both the United States and Canadian defense establishments, funded largely, to be sure, by the U.S. Nevertheless it exists in accordance with international treaty, which provides for the common defense interests of the two nations.

The statement that "anything in orbit is at least $3,000 per pound more valuable up there . . ." is slight justification for a space salvage system. As Drs. Canough and Lehman are undoubtedly aware, the value of salvage depends on the utility of the material salvaged. By the time technology enables the productive use of paint flakes in orbit, it will hopefully have reduced the launch costs of a pound of paint well below $3,000.

Lastly, the table illustrating the relationship between collision probability and cross section lacked a relevant piece of information; to what orbital altitude the table applied. Surely the probability of collision for a given cross sectional area varies dramatically from LEO to GEO!

The last two points would not likely have prompted this letter, since the article indicated that probability of collision does indeed vary with altitude, and the value of salvage is apparent to anyone who takes out the garbage. The first two, however, seemed to indicate an alarming sloppiness in terms of the "global" picture, which should, I think, have been corrected even at the expense of another couple of sentences.

F. W. POLNICKY

Monterey, CA

Dear Dr. Schmidt

The solution to the medical malpractice crisis in your April editorial "Ex Machina" was interesting, and possibly even workable. The problem, however, is that there are two sides to this story. While the American tort system does allow disproportionate malpractice judgments, medical errors which result in real harm to patients are a major problem today.

The Harvard Medical Practice Study (published in two parts: Brennan, TA et al. "Incidence of Adverse Events and Negligence in Hospitalized Patients." *New England Journal of Medicine* 1991; 324: 370-6 and Leape, LL et al. "The Nature of Adverse Events in Hospitalized Patients." *New England Journal of Medicine* 1991; 324: 377-84) reports a substantial amount of harm to patients in hospitals, much of which is preventable and due to negligent errors and substandard care.

Preventing injury due to errors in medical care is impossible, but reducing the frequency and severity of such injuries is a realistic goal which must be reached before we reduce malpractice compensation to a lottery. The authors of the second article cited above suggested that quality control techniques used in potentially high-risk industries, such as aviation, could help achieve such a reduction. In some areas of medicine (medical equipment and pharmaceuticals, for example) quality control and hazard reporting are already a fact.

Since computers are already used in many hospitals for accounting and medical records management, they can also be used to back up medical care givers' judgment and spot seemingly minor errors in patient care before they cause harm to a patient. Of course, not all medical professionals will respond posi-

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tively to this sort of system. Some will object to being second-guessed by a machine, while others will object to potentially damning criticism from the computer in the event of a mishap.

When I was a medical equipment repair technician some years ago, Hewlett-Packard introduced a cardiac defibrillator with an on-board computer which recorded (among other things) the time and date of the defibrillation, the patient's electrocardiogram, and *whether the operator properly applied the paddles to the chest*. Our local Hewlett-Packard sales rep was honestly puzzled that more doctors didn't rave over his new toy. I didn't have the heart to explain to him that no one wants a written record that a patient died from one's faulty defibrillation technique.

More and more hospitals are putting their patients' charts on computers to make billing, resupply, and data retrieval easier—adding quality control only requires the appropriate software. A computerized medical care quality-control system, then, would not be prohibitively expensive—even doctors' offices and hospitals which don't own big computers could be only a phone line and a modem away from a mainframe computer which offers this service.

Once we've made sure that medical care is as safe as humanly possible, then we should adopt a solution to the malpractice crisis—which we owe our physicians. They work long hours, sacrifice their personal lives, and expose themselves to legal liability and infectious disease so that we may enjoy the world's highest standard of health care.

I agree with you that a "cap" on malpractice awards would be an equitable measure, if it is combined with aggressive medical quality control measures and your "vending machine" malpractice insurance. In fact, Canada has implemented many elements of a workable medical care system which addresses malpractice.

Canadians enjoy much lower malpractice-related expenses than we do for several reasons, including a limit of about $200,000 on malpractice awards (indexed periodically for inflation), lower reimbursement for pain and suffering (15 percent of the average large Canadian claim compared to 47 percent of the average large US claim), national health insurance (reducing costs of correcting a malpractice-induced injury), and absence of the "contingent-fee" system under which lawyers gain a portion of civil awards in the United States.

Finally, in Canada the loser in a court case pays a large portion of the winner's costs, discouraging frivolous lawsuits often settled out of court here. This last point encourages the Canadian Medical Protective Association's policy of fighting frivolous malpractice suits and settling meritorious ones.

The commercial aviation industry actually encourages million-dollar policy-vending machines in airport lobbies as a way of touting the impressive safety of air transport. With a little prodding, the AMA might also see things that way.

VANCE P. FRICKEY

Houma, LA

To the Editor,

Geoffrey Landis's article in the April issue, "Starships, Robots, and Space Travel for the Next Millenium," gave a fascinating glimpse into the thinking of the scientists and engineers involved in the symposium. Was a video or transcript made? Was the article a collection of paraphrased notes, a distillation of the two-day event, or a complete transcript—for a "two-day" event it seems rather abbreviated? This would have

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been an excellent opportunity to use satellite technology to not only increase the size/scope of the panel/contributors, but to have allowed participation by an audience. A couple years ago, Texas Instruments conducted several such symposia on Artificial Intelligence. They were broadcast unencrypted to any site that wanted to organize a viewing (companies, college campuses, private satellite dish owners). An 800 phone number was provided for questions during appropriate periods. The events were advertised to targeted audiences.

I agree with many who feel that we are stagnating in regards to space research. Perhaps people such as those represented in the article should be on popular talk shows. Yes, the ideas (and messengers of the ideas) run the chance of being grouped with "My Uncle was a Mutant Turtle" stories, but just perhaps it might get many more people thinking of humanity's potential versus the next sports event. Anyway, the satellite symposium (it could be a series on *all* space technology) broadcast to a large audience in the corporate, educational, and governmental worlds might be significant.

I noticed Marvin Minsky was "a little" cautious with the ten-year projections—once burned (AI). As regards Paul MacCready's remarks that our "leaders" in government are shortsighted, I would contend that a "next quarter" mentality has permeated western culture (and western-influenced societies). Many business leaders, college professors, and administrators look no further than the next business cycle, semester, or reporting period. The time frame seems to be shrinking; we are no longer able to plan (or conceive) long-term goals that may even continue beyond our own mortality—even our wars are now quick "surgical" episodes (e.g., Panama, Grenada, "Desert Storm"). We are influenced less by reasoned long-term thought than by sound bites and what approaches subconscious video speeds. Perhaps we will achieve quantum time travel without really trying!

I didn't understand Minsky's final comment that a curtain might fall on exploration because of the increased uniformity of our globe (which is what I assume he meant). If we decrease social problems at the same time, such should lead to more exploration of our world as we seek differences elsewhere.

JOHN NEUBERT

Madison, NJ

The author replies. . . .

Dear Mr. Neubert,

The panel discussion printed in *Analog* was only a small part of the Vision-21 symposium; the article was a slightly edited transcript of one of the plenary sessions. The complete invited talks, contributed papers, and discussion session summaries can be found in the conference proceedings volume, *Vision-21: Space Travel for the Next Millenium*, NASA CP-10059, which is available from the National Technical Information Service (NTIS).

The potential of television and satellite technology to allow a virtual form of face-to-face participation between scientists across the globe is a quite underused advantage of emerging technologies. I expect that as the potential and the limitations of this mode of interaction become more well known, we will see a bit more of this type of broadly distributed conferencing.

The invited speakers and panel discussion were videotaped (which is how I made the panel transcript); the video has never been edited or distributed—it was intended more as a record for our

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own archives than a distributable program.

GEOFFREY LANDIS

Dear Mr. Schmidt:

I would first like to say that I enjoy your magazine immensely and I find only one problem with it: it's too short! One weekend and then I have to wait another month. Oh well, I know that there's nothing to be done, so I await the next issue eagerly.

Meanwhile, I would like to reply to Mr. Bowman's letter in Brass Tacks of the April issue. He questioned the silence concerning Moon colonies from those nations who are actively, albeit slowly, involved in the exploration of space.

If I understand some of the assumptions implicit in the letter, Mr. Bowman commented that because of the physiological problems of weightlessness in microgravity conditions, as well as the fact that space stations require "economical planetary support," the Moon and L5 are "logical first steps" for the location of a base/colony.

Why would a Moon base (assumed the first one), be cheaper economically than a near Earth-orbiting space station? Surely the first site on the Moon will be relatively crude and limited. Without the development of technologies now in their infancies at best, a first Moon base hundreds of thousands of miles distant would stand no chance of being self-sufficient. If I understand correctly what I have read in the past on this subject, a space station would make an excellent transfer point for resupply missions to the Moon. It would also give us a chance to develop the experience required to make a Moon base successful.

As far as the health concerns go, rotations would no doubt be required for the crews of space stations in Earth orbit. However, I seem to recall an article that stated similar problems would occur in low gravity situations such as those on the Moon, though not as severe as microgravity. Would exercise and the ever-present centrifuge be sufficient to curb such problems on the Moon? I don't know, perhaps someone else does. If not, then we have the problem of rotating crews from the Moon and back at what increase in expense as compared to Earth orbit?

Also, it has been shown with the help of the shuttle that the possibility for industrial profits exist in Earth orbit. It seems that those abilities are closer to being realized than anything that we could do on the Moon at this time.

There was also mention about the silence concerning a Moon base. Of this silence, I am personally unaware. It's true that the government is not currently brandishing grandiose plans for the settlement of the Moon, but what can you expect? Sometimes I feel lucky that the Space Station has not been completely wiped off the drawing board and the shuttle has not been scrapped for recycling. There are, however, many scientists, scholars, and other interested people talking about the Moon on a fairly regular basis. Granted not enough yet, but perhaps we need a little patience.

I think there are plenty of reasons, aside from fear of strategic one-upmanship between nations, that not many people are discussing establishing a Moon base as the first step in colonizing space. That is not to say there is no international conspiracy brought about by fear that is attempting to restrict human access to the Moon. This is entirely possible. However, a look at the fairly recent past tends to make me doubt such a condition exists. After all, we didn't stop production on the A-bomb because we were afraid someone would be mad

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that we got there first.

LARRY CHESEBRO
12610 Day Hollow
Houston, TX 77070

Sir:

I just received my April, 1991 *Analog* and CHEATED AGAIN.

In spite of your earlier promise not to use serials, you have done so for the second time since you made that promise. As far as I'm concerned, you have cheated me of about 55 pages of reading—or about 25% of a magazine.

I do not read serials—either as a serial or all together months later—frankly, they are not that good. And they don't fit my reading goals.

If Campbell had believed that me and others hated serials, *Astounding* would still be in business. If you check old copies, you'll find he told those of us who wrote him that he'd do as he pleased and he damned sure would print serials. He stated that serials brought repeat sales. I and many others said they also drove off sales. He didn't believe us. We left. Otherwise, I'd have a complete set of magazines from 1939 on.

Recently, I have been rereading old magazines and I again find your serials are not worth reading—and again feel cheated because those old copies bring less reading pleasure than they should.

I had already told my wife not to renew *Analog* because of all the serials, when you promised to stop using them. If you continue, you may be sure that I will not renew. You may be sure serials drive off readers. I'll bet you cannot prove that serials add enough readers to compensate.

You could cut your price 25% those months that you print a serial, I guess.

MEL ALBRIGHT
Box 8500 Rt. 3
Bartlesville, OK 74003-9803

I'm sorry you don't like serials, and would regret losing you as a subscriber—but please don't accuse me of breaking a promise I did not make. I have never *promised anyone that I would* never *again use serials! I can only conjecture that you're referring to my Mid-December 1988 editorial, and that you either didn't read it very carefully or didn't reread recently.*

Interestingly, while responses to the editorial included several from people who, like you, hate serials and would like to see them banished, there were just as many from people who like them and were afraid I was *going to discontinue them entirely. I can only hope that people in* both *camps will have enough tolerance to recognize that a magazine has to please other readers, with different preferences, as well as themselves.*

*As for "*Astounding *would still be in business": it is! We're it; only the name has changed, and our circulation is still healthier than that of any other magazine devoted primarily to science fiction.*

PS: How can you know a serial is "not that good" when you haven't read it?

Dear Dr. Schmidt,

In his letter in the April issue of *Analog*, Dr. S. J. Rosenberg makes an error that I think you, he, and Phil Klass would wish to correct. His second paragraph opens by referring to William Tenn as ". . . the late Mr.Tenn." I'm happy to report that Mr.Tenn, or rather, Phil Klass (which is his true name) is alive and well in Florida. He and his wife, Fruma, moved there from Pennsylvania after his recent retirement.

While I'm writing, let me thank you for returning serials to *Analog*'s line-up. And what a serial! Harry Turtledove's stories are some of the finest being pub-

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lished today and this first installment of *The Great Unknown* is no exception. It reminds me of some of Heinlein's best work. I've read science fiction for about 20 years now: *this* is the kind of story that keeps me reading it.

CURT PHILLIPS

Abingdon, VA ■

IN TIMES TO COME

● January is our double-size anniversary issue, marking 62 years of *Astounding* and *Analog,* and the lead story (with cover by Vincent Di Fate) seems peculiarly appropriate to that occasion. It's a novella, "He Who Must Die," co-written by a long-time *Analog* author and former editor (Ben Bova) and a rising young writer (A.J. Austin) who recently launched his career in these pages. It was inspired by yet another *Analog* favorite of long-standing: the title character was drawn (with the author's blessing) from a well-known work by Gordon R. Dickson. The problem is new, though Charles Sheffield touched on it in a recent fact article. Given that a really big, ambitious project depends on the driving energy of one far-seeing individual, how do you sustain it beyond that individual's lifetime? Especially when most other people live much longer....

The oversize issue allows us to present an unusual range of fiction, in length, subject matter, and tone. We'll offer novellas by Stephen L. Burns and Daniel Hatch, novelettes by William Walling and Harry Turtledove, and short stories by Mary Caraker and others. Plus two nonfiction features: Hans Moravec's inside look at the real-life quest for "Th Universal Robot," and Greg Barr's "State of the Art" repo on "Contact in the Classroom," a most intriguing expe ment in education.

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IT'S ANLAB TIME AGAIN— PLEASE VOTE!

Mid-December is our last issue for 1991, and as usual we're asking you to help us via The Analytical Laboratory. Not only will your votes provide tangible rewards for your favorite authors and artist, but your feedback will help guide our selections of what to offer you in the future. Your vote is important! Here's how to cast it:

Look over all your copies of *Analog* dated 1991, or refer to the annual Index which will appear in our January 1992 issue. Pick your *three* favorites in each of the following categories: novella or novelette (a single category, for AnLab purposes), short story, science fact article, and cover. If you're not sure about a piece's category, you'll find it listed in the Table of Contents for the issue in which it appeared, as well as in the Index.

List your choices in order of preference (your favorite in each category is #1) on the ballot below, and mail it in. The ballot is intended to make it easier for you to vote, but if you don't want to cut if out, feel free to copy it. We'll tabulate the votes and let you know how they came out a few issues hence.

Please send your votes to:

AnLab, *Analog,* 380 Lexington Avenue, New York, NY 10168-0035.

To be sure your vote counts, please mail it in time to reach us by February 1, 1992.

Thank you very much!

—The Editor

ANLAB BALLOT 1991

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1. _____
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a calendar of analog upcoming events

6-8 December
TROPICON 10 (South Florida SF conference) at Ft. Lauderdale, Fla. Guest of Honor—Andre Norton. Info: Tropicon 10 % SFSFS, Box 70143, Ft. Lauderdale FL 33307.

13-15 December
SMOFCON 8 (SF convention runner's conference) at Shilo Inn, Portland, Ore. Info: Smofcon 8, Box 5703, Portland OR 97228. (503) 774-7592/283-0802.

3-5 January 1992
EVECON 9 (Washington area first-of-the-year con) at Holiday Inn Crowne Plaza, Crystal City VA. Info: Evecon 9, % FanTek, 1607 Thomas Road, Ft. Washington MD 20744. (301) 292-5231.

January 1992
BASH '92 (Boston-area Star Trek™ convention) at the Sheraton Tara, Braintree, Mass. Registration—send $10 deposit for membership information. Info: Bash Conventions, Box 266, Quincy MA 02269.

14-16 February 1992
BOSKONE 29 (New England area SF conference) at the Sheraton Monarch Place & Springfield Marriott Hotels, Springfield, Mass. Theme—"The Art and Practice of Storytelling." Guest of Honor—Jane Yolen, Official Artist—Jody Lee, Special Guest—Dave Langford. Registration—$29 in advance, more at the door. Info: Boskone 29, Box G, MIT Branch PO, Cambridge MA 02139-0910.

3-7 September 1992
MAGICON (50th World Science Fiction Convention) at Orange County Civic & Convention Center, Orlando, Fla. Guest of Honor—Jack Vance; Artist Guest of Honor—Vincent Di Fate; Fan Guest of Honor—Walter A. Willis. Registration—$85 adult/$45 child until 30 September. Supporting—$25. This is the SF universe's annual get-together. Professionals and readers from all over the world will be in attendance. Talks, panels, films, fancy dress competition—the works. Join now and get to nominate and vote for the Hugo Awards and the John W. Campbell Award for Best New Writer. Info: MagiCon, Box 621992, Orlando Fl 32862-1992. (407) 275-0027. UK agent Peter Weston, 72 Beeches Drive, Erdington, Birmingham B24 ODT UK.

29 October-November 1992
WORLD FANTASY CONVENTION at Callaway Gardens, Pine Mountain, Ga. Limited membership. Registration—$100 in advance. Info: World Fantasy Convention '92, Box 148, Clarkston GA 30021. (include SASE)

Note: when writing to any convention for information, it is always polite to include a large self-addressed stamped envelope (SASE).

—Anthony Lewis

Items for the Calendar should be sent to the Editorial Offices six months in advance of the event.

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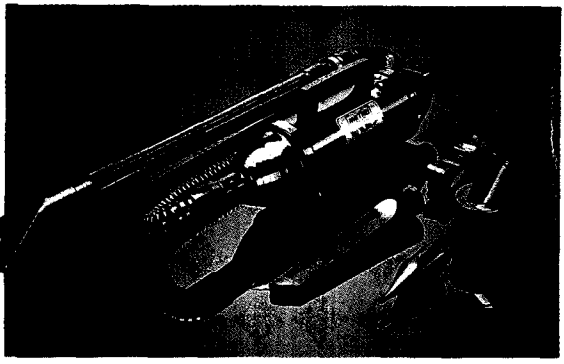

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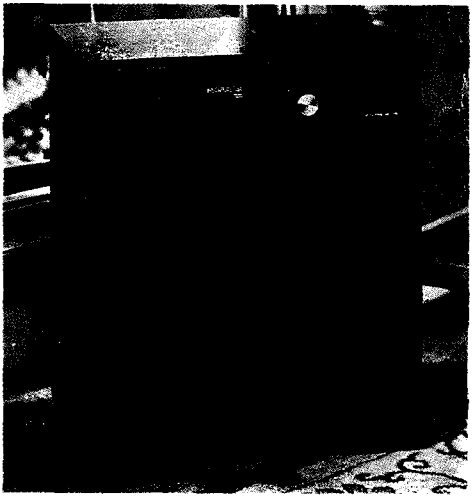

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